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GASTROJEJUNOSTOMY.

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The greater number of diseases of the stomach which require surgical relief are situated in the pyloric end and associated with actual or potential obstruction necessitating gastrojejunostomy.

In the year 1881 Wölfler brought out the anterior method of gastrojejunostomy, and in 1882 Van Hacker developed the posterior method. The anterior method required a loop of jejunum 16 to 20 inches in length, sufficient to pass around from underneath the transverse colon to the anterior surface of the stomach. The posterior method, until within recent years, was done on a loop of jejunum from 7 to 9 inches in length. These operations were sometimes followed by bile regurgitation and occasionally by a true vicious circle, which simply means obstruction to the jejunum just beyond the gastrojejunal opening.

So far as the posterior operation is concerned, the elimination of the loop by applying the jejunum to the stomach as close as possible to its origin, an inch and a half to three inches, has almost done away with this particular form of trouble.

Because of the loop the anterior operation will occasionally be followed by bile regurgitation, and the best means of obviating this complication in the suture technic, is to follow the plan of Hartmann, i.e., holding the jejunum by a mattress suture to the stomach one inch proximal and one inch distal to the suture-line of the gastrojejunostomy.

Anterior gastrojejunostomy is by no means an obsolete procedure. In cases of cancer of the stomach in which the situation of the growth makes the posterior wall inaccessible, and in cases of ulcer in which adhesions to the posterior wall render the posterior operation unusually hazardous, the anterior method should be chosen.

In our early work gastrojejunostomy was performed by the anterior method, using the Murphy button, which mechanically prevented angulation and bile regurgitation, but was open to the objection that the aperture sometimes contracted as a result of the weight of the attached jejunum. The button union is the most perfect of any type of anastomosis, but its very perfection, as shown by the accurate layer-by-layer union, makes it less resistant to traction weight than a suture seam. The large majority of button operations were satisfactory and we have a number of patients operated upon by this method more than 15 years ago who have remained in perfect health. Since adopting Hartmann's technic, now more than five years, no instances of bile regurgitation have followed the anterior suture operation.

The technic posterior gastrojejunostomy has been perfected by the work of various surgeons. The no-loop method with the Murphy button was first used by Peterson in the Czerny clinic. Mikulicz next used the method with a transverse jejunal incision and suture, eliminating the button. In 1903 C. H. Mayo began making the no-loop operation with the longitudinal jejunal incision, essentially as we make it to-day.

One of the most important contributions to the technic of gastrojejunostomy was the application and popularization by Moynihan of the holding clamps for bringing the jejunum and stomach in apposition to prevent soiling the field of operation. Since the no-loop operation is done upon parts somewhat deeply situated, the clamps are a convenience and they have retained their popularity in nearly all of the American clinics, although they have been abandoned in many foreign clinics because of the occasional hemorrhage from the suture-line after they were removed. This hemorrhage appears as a hematemesis or melena some hours after the operation, as the blood accumulates in the gastrointestinal tract. In a few such cases in my early experience I supposed that the bleeding came from the ulcer and was due to operative manipulation until I was obliged to reopen the abdominal incision in two cases for the purpose of checking hemorrhage within 18 hours after operation. The stomach was brought up and its anterior wall opened by a longitudinal incision, exposing the ulcer, which was found dry in both cases; the hemorrhage coming from the posterior suture-line of the gastrojejunostomy.

In order to insure against this accident I began using a third row of catgut sutures, uniting the mucous membranes along the posterior suture-line. The accident is not so likely to happen on the an-

terior wall, and since applying this muco-mucous stitch to the posterior line there has been no bleeding following gastrojejunostomy in any of our cases (Fig. 1).

Moynihan and Littlewood advised trimming off the redundant mucosa of the margins of the incision uniting the stomach and intestine. We have usually followed Ochsner's technic in this respect, that is, placing the second row of sutures before opening the cavity of the stomach and jejunum

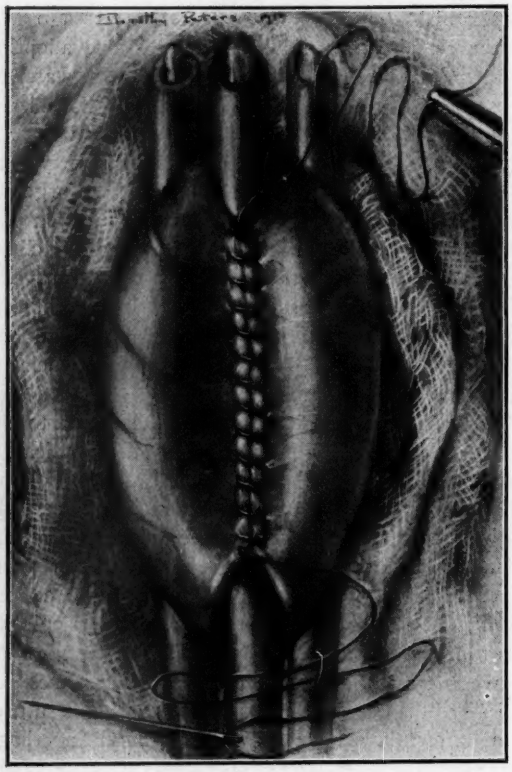

Fig. 1.—Gastrojejunostomy made with three sutures on posterior line because of occasional hemorrhage into the gastrointestinal tract after clamps are removed. Drawing shows posterior line of muculoperitoneal sutures in place.

(Fig. 2) thus preventing the posterior suture-line from being soiled. The mucous coats of the stomach and intestines are opened near the outer margin, which throws a little flap of redundant mucous membrane toward the suture-line and this is brought together with the third row of sutures mentioned above (Fig. 3). However, should there be redundant mucosa it will be wise to trim it away. Since silk or linen is slow to be cast off, we use chromic catgut for the inner and linen for the outer row of sutures. I have seen silk sutures hanging in the gastrojejunostomy 18 months after operation. In gastrojejunostomy for carcinoma, however, we use linen for both layers of sutures, because union is slow in these cases and the suture must last long enough to insure firm union.

There has been a great deal of discussion as to the direction the gastrojejunostomy should take on the posterior wall of the stomach. I agree with Moynihan that too much attention has been paid to this detail. For a number of years in the clinic at St. Mary's Hospital, we have used, with continuous satisfaction, an opening slightly oblique in direction, from right to left above down (vertical oblique). Moynihan uses a vertical opening, and in the few cases in which we have used this opening the results were satisfactory.

A mesocolic band* often extends downwards upon the upper jejunum at its origin. If such band or bands exist they should be trimmed backward since, if the free portion of the jejunum beyond the band is used, a considerable loop of intestine will lie above the anastomosis and the gastrojejunostomy will not be of the no-loop variety. It can be stated within reasonable limits, that the closer the gastrojejunal opening is made to the origin of the jejunum, the less danger there will be of bile vomiting.

In the average case in which gastrojejunostomy is performed, the transverse mesocolon is torn through in the avascular part near the center of the vascular loop of the middle colic artery. Occasionally the transverse mesocolon will be found to have two vascular arcades, due to the division of the middle colic vessel into a right and left branch; the right ananstomosing with the right colic and the left with the left colic artery. In operating, the larger arcade is usually chosen, but the distinct preference is given to the left arcade, other things being equal.

The torn margins of the gastrocolic omentum in the average case should be fixed by three or four sutures to the suture-line of the gastrojejunostomy. The sutures should pick up the peritoneum of the mesocolon a quarter of an inch above the rent, and after fastening down to the suture-line, the torn margins should be neatly tucked in so that no opportunity will be afforded the formation of secondary adhesions. If the mesocolon be *fat* the torn margins of the opening should be attached to the *stomach* at least three-fourths of an inch from the gastrojejunostomy with three or four sutures to avoid the formation of a ring or collar-like band at the site of the operation. Two cases have given us trouble from this cause.

* W. J. Mayo, Annals of Surgery, January, 1908.

Gastric ulcers should be excised and duodenal ulcers infolded with sutures. In some cases it is impossible to excise a gastric ulcer without great risk, and in the occasional case in which the duodenal ulcer is already roofed in by adhesions, it may not be advisable to infold it.

Closure of the pylorus has been advocated as a routine procedure following gastrojejunostomy. Sutures placed in the outer wall of the stomach and duodenum in such manner as to infold the pylorus, produce mechanical obstruction only temporary in character. Clinically and experimentally, nothing short of complete division of the pylorus, turning in the end of the stomach and the end of the duodenum can be expected to give permanent results. Occasionally we practice some method of closure of the pylorus, but as a rule, if the indications for gastrojejunostomy are clear, the operation will be successful without closure, and if the choice of operation has been bad for the patient, it will not be improved by the addition of closure of the pylorus.

The preparation of patients for gastrojejunostomy is simple. If there be marked obstruction with food retention it will be wise to empty the stomach twice a day with the stomach tube for a few days until it recovers its tone.

The patient is admitted to the hospital about 2 o'clock the day preceding the operation. At 3 o'clock one to two ounces of castor oil is given, and at 5:30 a light supper. The castor oil is very effective, and, unlike salines, does not produce watery, exhausting stools. It is also more thorough and, if an excess be given, it merely passes off. A bath is given about 8 o'clock in the evening. In the morning the field of operation is carefully shaved, using water without soap, and allowed to become dry. If the patient is in an exhausted condition 1/6 grain of morphia is given. Ether is administered by the drop method. The field of operation is cleaned with benzine, which removes all grease, dead epithelium and extraneous matter. The benzine dries rapidly and is followed by a coating of three and one-half per cent. solution of tincture of iodine, which should be made fresh within a week, since old tincture of iodine undergoes chemical changes that are irritating to the skin.

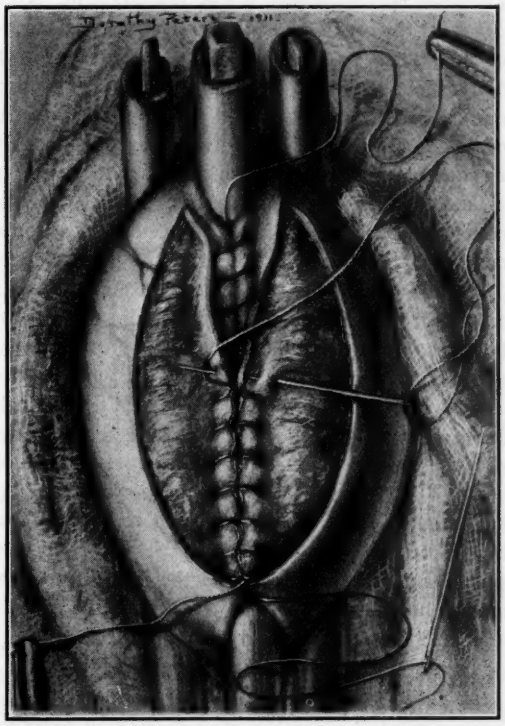

Fig. 2.—Gastrojejunostomy made with three sutures on posterior line because of occasional hemorrhage into the gastrointestinal tract after clamps are removed. Drawing shows catgut buttonhole suture applied posteriorly without opening mucous membrane.

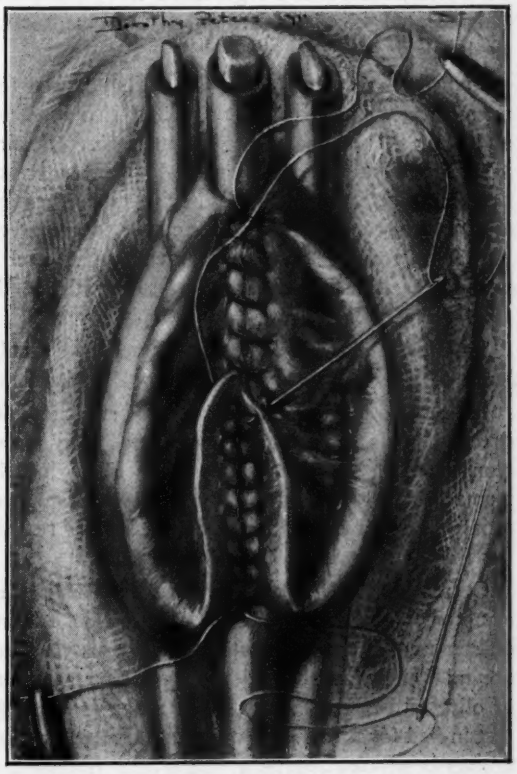

Fig. 3.—Gastrojejunostomy made with three sutures on posterior line because of occasional hemorrhage into the gastrointestinal tract after clamps are removed. Drawing shows mucous membrane opened. Running suture of catgut to bring mucous coats of stomach and jejunum.

After the operation the patient is placed in the semi-sitting posture on a buttock rest, which is merely a sling of gauze wrapped with sheet and fastened to each side of the head of the bed. The patient is propped up by pillows and kept in this position by the buttocks resting in the sling. During the first night hot water is allowed in moderate amounts, an ounce or two at a time, unless the patient be nauseated. If there be much pain a hypodermatic injection is given of 1/100 grain of atropine and 1/6 grain of morphia. If greatly debilitated, the patient is given 10 to 15 minims of camphorated oil, hypodermatically, from four to six hours apart.

Immediately after placing the patient in bed rectal salines by the Murphy method are commenced, and four to six quarts are given during the first 24 hours. Patients are allowed albumen water and a little weak tea the day following the operation, and on the second day cereals and soups are given. At the end of the week a moderately full diet is permitted, advising the patient to masticate the food thoroughly.

Patients are up at the end of a week and usually leave the hospital in from ten to twelve days.

An acute attack of dilatation of the stomach with great distress, vomiting of bile, etc., may occur along in the second or third week. Emptying the stomach with the stomach tube two or three times a day for several days is the most effective remedy for this condition.

Occasionally the patient will have distressing symptoms in the stomach not due to bile, coming on some weeks after operation. If these symptoms are mild they may be relieved by giving an ounce of olive oil before meals. In the more severe cases rest in bed for a few days on a milk diet will almost always be efficient.

REFERENCES.

Wölfler: Loc. cit., Keen's Surgery, iii, 1910, p. 888.

Von Hacker: Arch. f. klin. chir., xxxii, p. 616.

Hartmann: Surgery, Gyn. & Obst., April, 1908.

Peterson: Surg., Gyn. & Obst., ii, p. 341.

Littlewood: Lancet, London, Nov., 1900.

Mayo (C. H.): Annals of Surgery, Nov., 1905, p. 641-655.

Mikulicz Bost. Med. & Surg. Jour., cxlviii, p. 609-611.

Moynihan: J. A. M. A., Dec. 24, 1904; Lancet, London, Sept. 21, 1907

COLONIC INTOXICATION.

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The intestine originally consists of a simple tube, the component parts of which are known as the fore-, mid- and hind-guts. The fore-gut comprises the rudiment of the pharynx, esophagus, stomach and part of the duodenum. The hind-gut forms the descending colon and rectum. Both the fore- and hind-guts have a tubular form from the earliest stages of development, while the mid-gut, which forms all the small intestines as well as the ascending and transverse colon, is for a long time a mere groove opening freely into the yolk sac. The communication between the mid-gut and the yolk sac gradually lessens in size until its only remnant is the ductus vitello-intestinalis. Originally the intestinal tube is attached to the parietes in the median line both dorsally and ventrally by a double membrane, the dorsal and ventral mesenteries. (Fig. 1.) The ventral mesentery soon disappears except for such structures as the round ligament of the liver. The intestinal tube, as it grows, forms a loop (umbilical loop), the apex of which is imbedded in an excavation in the fetal end of the umbilical cord, and it is there in communication with the umbilical vesicle by means of the vitelline duct. The descending, *i. e.*, the proximal part of the umbilical loop, grows much more rapidly than the descending or distal loop. Very early a bud appears on the distal loop and the intestine beyond the bud becomes larger than the rest of the original intestinal tube. This bud forms the cecum, and the enlarged tube forms the large intestine.

As development proceeds and the intestine increases greatly in length a remarkable torsion of the originally simple tube takes place.

The cecal end of the large intestine becomes thrown over the small intestine, as shown in Figs. 2, 3, 4, until the cecum lies under the liver in the upper right quadrant of the abdomen and the transverse and descending segments of the colon come to occupy their permanent locations. Some time about the seventh month, or even much later, the cecum descends to the iliac fossa and the ascending colon becomes a fact. The colon, as we have seen, was originally provided with a mesentery, but this mesentery and the posterior surface of the ascending colon become applied to and adhere to the posterior parietes. The mobility of the ascending colon is now lost. The cecum itself is supposed normally not to adhere to the posterior parie-

tes, but as it is essentially a part of the ascending colon it often partakes in the fixation of the colon to a greater or less extent. The descent of the cecum and adjacent colon and the subsequent fixation or anchoring of the latter, being late phenomena of development, are often incomplete or irregular. Occasionally the cecum fails to descend and lies permanently under the liver. When it does descend into its normal position its connections with the parietes may vary much. It may be a long and absolutely free organ only connected

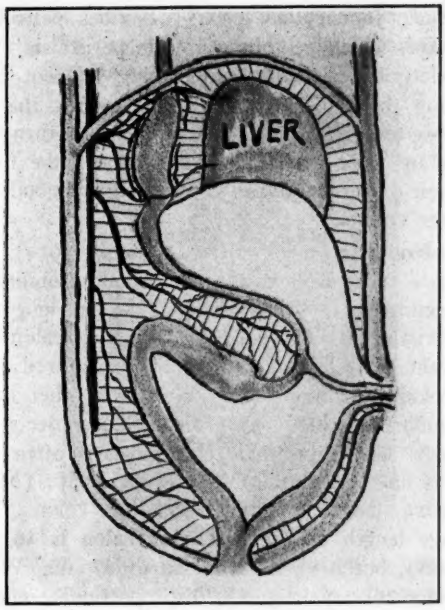

Fig. 1.

with the abdominal wall by means of its continuation, the colon; it may be adherent by various peritoneal bands to the abdominal wall; the ascending colon itself may fail to unite with the posterior parietes and may retain its embryonic mesentery to a large extent. From this cursory review of embryology it follows that we ought not to be surprised that there are many so-called anomalies in the anatomy of the ileo-colic junction; we ought rather to be surprised that there are so few.

The terminal portion of the ileum necessarily taking part in the late changes of position to which the cecum is subjected must also to some extent share in the cecal tendency to anomaly.

It may be worth while to note a few of the anomalies of the cecum, ileum and ascending colon which may give rise to trouble requiring surgical intervention.

The ascending colon may have retained its meson, but the cecum may have become adherent to the parietes near the kidney. As the cecum and ascending colon gravitate towards or into the pelvis, the cecal adhesions may stretch, forming secondary mesenteries. A good example of this is shown by Zuckerkandl. (Atlas Topograph. Anatomie, p. 362. Fig. 326.)

In development the ileum may form abnormal connections with the parietes. Fig. 5 represents the condition found in a young lady who for over three years had suffered from recurring attacks of abdominal pain, without nausea and generally without fever. The attacks commonly came on during the night. When a purgative was taken, an attack

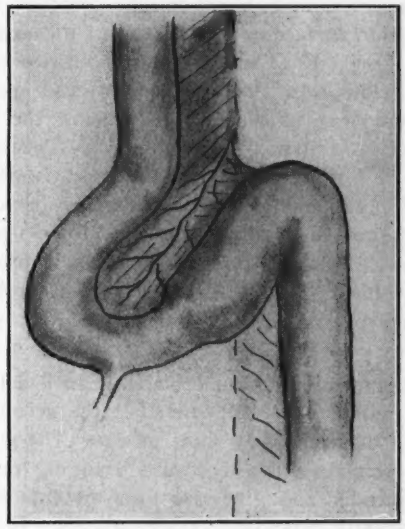

Fig. 2.

of pain frequently preceded evacuation. There was tenderness rather indefinitely located in the right iliac region. The diagnosis of appendicitis had been made by several physicians. Abdominal examination was negative except for the presence of some tenderness and well marked rigidity a little below McBurney's point. The cecum was low.

On operation an ileo-pelvic band (such as I have described) was found and divided. Besides this there was found a stellate deposit of scar tissue on the under surface of the mesentery of the ileum close to the band. Such a deposit of scar tissue corresponds to the band which Lane described and which occasions Lane's kink. Thorough mobilization of the terminal segment of ileum has apparently led to a complete cure.

A very similar condition was found in a physician (aged 28) who had suffered from intestinal obstruction 14 years previously. The obstruction lasted about 12 days and was overcome without

operation. I will not describe his symptoms except to remark that he was very constipated and that after taking a purgative he suffered from pain and soreness in the abdomen until he felt something "pass" or "give way" in the right iliac fossa when he knew that he would soon have an evacuation and feel well. There was tenderness and rigidity at McBurney's point. We felt sure the patient suffered from gall-stones (I have purposely avoided giving the symptoms) and strongly suspected the presence of an iliac kink. On operation (besides gall-stones) we found a long, non-adherent and not noticeably diseased appendix, the mesentery of which was anterior to the ileum. A broad band of tissue containing blood-vessels stretched from the anterior surface of the cecum to the external parietes (Fig. 6). This band was about two inches wide. Below the band the cecum was mobile. The ileum near its cecal end lay below the brim of the pelvis and was held there by flat adhesions (Fig. 6). On the separation of these adhesions a band of peritoneum was found passing far down into the true pelvis (Fig. 7). The meso-sigmoid was retracted and the sigmoid could not be brought to the wound. The ileo-pelvic band was probably the cause of the attack of obstruction 14 years previously.

The cecum may descend further than usual and be very mobile. At the same time the vermiform appendix may possess a short meson. The weight of the cecum may easily cause dragging on the meso-appendix and give rise to symptoms which are frequently diagnosed as appendicitis. In such a case, removal of the appendix will give relief because of the necessary division of the meson. Full relief may not be attained because some of the symptoms at least may be due to the long mobile cecum.

Wilms claims excellent results from cecopexy in cases of mobile cecum simulating chronic appendicitis. (*Zentralblatt für Chir.*, 1908. No. 37. 1911. No. 29.) If the cecum is not only ptosed but is very large he advises ileo-transversostomy instead of cecopexy. Dreyer found the cecum freely mobile in 67 per cent. of the autopsies performed by him—hence it cannot be considered pathologic. Dreyer points out that a certain degree of mobility is of advantage in pregnant women as it permits the cecum to be pushed out of the way of the enlarging uterus. To me it appears that the cecum would be in peril only if it was fixed at a low level.

Fromme, while agreeing that a moderate mobility of the cecum is of advantage to women, yet remarks that too great mobility can and does lead to trouble in that the cecum may be pushed up by the uterus and twisted on itself. It seems reasonable to suppose that a *freely* mobile cecum and ascending colon would be in the same condition as a normal sigmoid flexure; *i.e.*, it would give rise to no trouble, but that a freely mobile cecum with a fixed colon might suffer torsion just as a sigmoid colon the base of whose meson is contracted is liable to volvulus. The same remark would apply to an ascending colon which was partly mobile and partly fixed. Travel (*Rev. Med. de la Suisse Romand.*, January 20, 1904) describes pericolitic adhesions which he thinks impede peristalsis. He also describes a band immobilizing but not constricting the colon just above the cecum, the cecum so mobile that it was possible to turn the cecum up, over the band so as to touch the liver. Division of the band and cecopexy gave good immediate results.

Lardennois (*La Pr. Med.*, June 4, 1910) describes a remarkable case of ptosis and mobility of the cecum where that viscus was 13 cm. long and was twisted on the axis of the ascending colon and adherent by a band (congenital or acquired?) to the colon. Lardennois has seen four other cases of similar extensive ptosis out of 80 subjects examined. He thinks that cecal ptosis is often due (*a*) to undue length of the cecum itself; (*b*) to excessive length of the ascending colon. The average length of the ascending colon is 19 cm. (Cohan), but it varies from 10 to 29 cm. When the colon is very long it is disproportionate and ill adapted to the abdominal cavity and hence tends to push into the pelvis; (*c*) to undue mobility of the initial portion of the large intestine. Contributing causes are constipation; want of prominence of psoas muscle; size of pelvis; abuse of corset; weakening of the abdominal wall—*e. g.*, by pregnancy.

John G. Clark (*Journ. A. M. A.*, August 6, 1910) believes that ptoses of the colon (cecum—transverse—sigmoid) are generally congenital and that *apparent* ptosis of the transverse colon is often merely due to that intestine being so redundant that in order to find domicile in the abdominal cavity part of it must lie low down.

The developmental anomalies which have been described very frequently cause no trouble, but frequently they do. The symptoms when present either mimic those of chronic appendicitis or are distinctly referable to absorption of toxins from the large intestine due to chronic intestinal stasis.

Chronic intestinal stasis may be due to any cause

which impedes the normal onward progress of the intestinal contents but does not cause complete or acute obstruction. Toxemia from stasis is very much more common than has usually been taught; in fact I believe it to be one of the commonest conditions met by the physician. Arbuthnot Lane has for many years studied the causes of inveterate constipation, but only recently have his teachings been receiving the attention which they deserve. According to him the constipation or, better, the colonic intoxication, is due to ptosis of the colon and to the formation of angulations or kinks which impede the proper progress of the intestinal contents. As a resudt of the erect posture, habits of

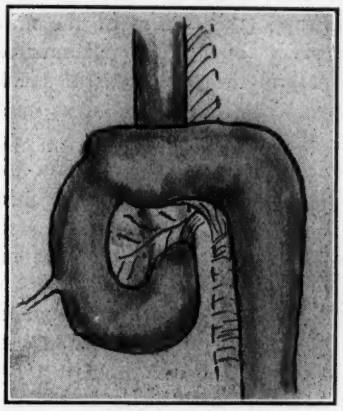

Fig. 3.

civilization, errors in diet, inattention to obtaining regular and proper evacuations, etc., there results an overloading of the cecum, transverse colon and sigmoid.

The earliest and most conspicuous changes are most apparent in the first instance in the cecal portion of the large intestine and gradually extend to its termination.

The cecum becomes dilated and elongated, so much so that, when distended, it occasionally fills the entire pelvis, displacing and compressing the viscera which normally occupy this space.

"The portion of the cecum above the brim of the pelvis, together with the ascending colon, is retained in a position of abnormal fixity to the posterior wall of the abdomen. This is effected by the development of adhesions between the outer aspect of the large bowel and the peritoneum covering the abdominal wall in its vicinity. In advanced cases these adhesions are supplemented by a mesentery in which vessels of some size are contained. These adhesions or acquired mesenteries are the materialization in peritoneum of lines of force exactly as the skeleton represents the materialization of lines of force, which, when transmitted in one direction, are laid down in compact tissue, when transmitted in various directions in cancellous tissue. This I have demonstrated and illustrated in 'The Operative Treatment of Fractures,' to which I would refer the reader for details. The adhesions merely fix the bowel, but occasionally they constrict its lumen very materially in one or more situations and render it liable to become obstructed. Not only do the adhesions anchor this part of the large bowel, but they also bind down to the iliac fossa a portion of the appendix. They usually attack

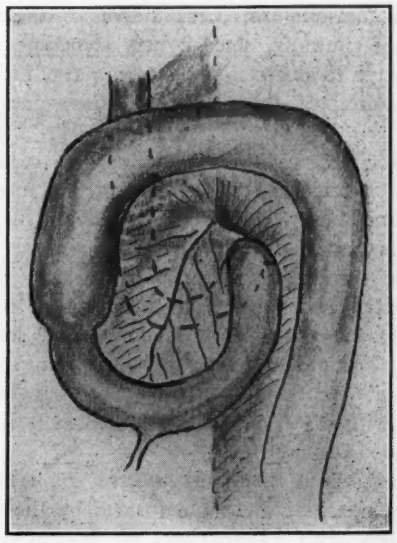

Fig. 4.

about a third or a half of its proximal portion, often terminating below in an abrupt, free margin, or forming a pucker in its normal mesentery. The acquired mesentery of the appendix is often distinct from its normal mesentery, while at other times it is intimately adherent to it. Unless the appendix be damaged by ulceration or adhesions, if this band be removed the appendix with its mesentery resumes its ordinary form and mobility. This band anchoring the appendix becomes progressively shorter from its proximal to its distal limit, fixing this portion of the appendix so that its distal portion is more or less abruptly flexed upon its proximal part, especially when the full cecum is displaced downwards by its weight. In this manner the proximal portion of the appendix becomes part of the anchor or tie which opposes the downward displacement of the cecum, and is made to perform the function of a ligament—a purpose for which it was never evolved."

This is by no means the only way in which the

appendix may be fixed and take part in the trouble.

"The upper limit of the ascending colon is abnormally fixed and occupies a higher position than in the healthy subject. This is produced by the contraction of an acquired band of peritoneal adhesions, which drags the flexure upwards and helps to oppose the downward displacement of the large bowel. The anchoring band is attached to the kidney and to the abdominal wall immediately external to it, the flexure being bound to them more closely and rigidly than normal. The increased intimacy of relationship of the hepatic flexure to the kidney and to the ilio-hypogastric, ilio-inguinal and last dorsal nerves is also of importance clinically, since it may sometimes render it difficult to differentiate between conditions due to the drag of the colon and those due to the kidney.

"Associated with the fixation of the cecum and ascending colon and the consequent limitation in its free functioning there is much wasting of the involuntary muscle wall.

"The transverse colon forms a loop with its convexity downwards, and the degree to which this descends varies. A portion of the loop frequently occupies the true pelvis, reaching quite to its floor, where it disputes possession of that cavity with the cecum, which has usually occupied it previously.

"The descent of the transverse colon increases the sharpness of the angle formed by the ascending colon with its proximal or descending limb, and also that formed by its ascending limb with the descending colon. The splenic flexure is also dragged upwards and backwards in an abnormal manner by a hypertrophy and contraction of the pleuro-colic fold, supplemented by other peritoneal bands of new formation, developed with the object of sustaining the strain of this flexure exerted by the loaded transverse colon in the erect position of the trunk.

"Where the descending limb of the transverse colon comes into contact with the ascending colon and cecum, adhesions unite them directly to one another, while below the mesentery of variable breadth connects them indirectly. The same formation exists on the left side between the ascending loop of the transverse colon and the descending colon.

"The presence of these mesenteries and adhesions render any return of the transverse colon to its normal level impossible, while its further descent is favored by their progressive contraction. The descending colon is fixed in a manner similar to the ascending colon by adhesions and mesenteries attaching its outer surface to the peritoneum covering the adjacent abdominal wall."

A similar deposit of scar tissue is formed on the meso-sigmoid and by contraction may either pull the whole sigmoid loop against the abdominal wall, immobilizing it completely, or the process may be most marked at the base of the meson pulling afferent and efferent portions of the gut together but leaving their middle or the major portion free. This last condition is a frequent cause of volvulus. In my experience the deposit of scar tissue is on the outer leaf of the meson and if this is divided the sigmoid becomes mobilized. Lane thinks the deposit of scar tissue an effort of nature to increase the supporting power of the meson; most other observers think it of inflammatory origin. To us at present the etiology is of small moment, the presence of the condition and its importance is certain.

Virchow described it under the term *Mesenterial-schrümpfung* and regarded it as a chronic peritonitis.

Contraction of the scar tissue not merely immobilizes the sigmoid but diminishes its lumen and at the same time the muscular coats waste. Partial intestinal obstruction is a very common result of sigmoid fixation. For lack of a better name the condition described may be dubbed meso-sigmoiditis.

The ptosed cecum has been described as supported by various adhesions attached to it and to the appendix, but it may also be supported by a thickening or deposit of scar tissue on the *under* surface of the meso-ileum, which acts through the intermediation of the terminal portion of the ileum.

Lane writes (*Lancet*, April 30, 1910): "The contraction or cicatrization affects only the posterior layer of the mesentery. In its earliest stages it can be felt rather than seen, since the contracted area of peritoneum then only appears more opaque than that in its vicinity. Later distinct thickenings or bands form along the lines of resistance. These are blended with the mesentery. When fully developed they form a mesentery which, while it is in contact with the peritoneum of the normal mesentery, is distinct from it, and attaches the wall of the bowel adjacent to it. The anchored portion of the ileum is not only kinked in one plane but its lumen is also reduced by torsion of this part of the bowel itself on its long axis. This results from the progressive encroachment of the newly formed contracting bands of peritoneum on

the wall of the bowel in the vicinity of the mesentery." . . . "I have seen it well developed in a child, seven years old, and indications of its presence still earlier in life."

The effects produced by Lane's kink are identical with those produced by the ileo-pelvic bands which I have described as developmental anomalies, and possibly both Lane and I are referring to the same thing. I have seen contractions in the meso-ileum which pull the terminal segment of the ileum upwards and correspond exactly to Lane's description, while the ilio-pelvic band pulls

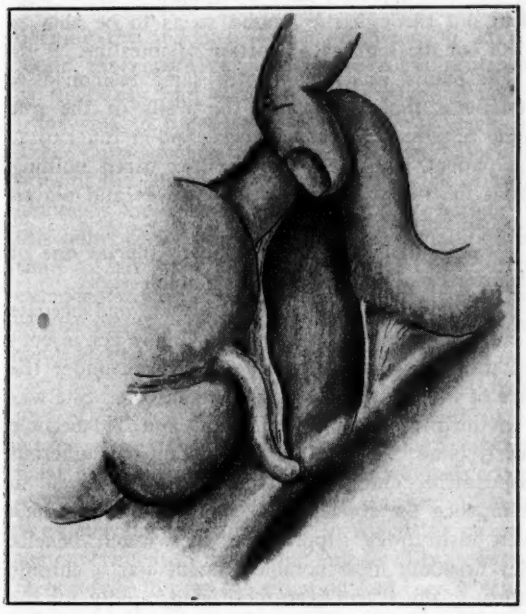

Fig. 5.

the ileum downwards and show no evidence of sclerosis.

In 1905 (*Monthly Cyclopaedia of Practical Med.*, VIII, 341) I described a condition simulating chronic appendicitis in which on operation the ascending colon and cecum are found covered by a delicate curtain or web of adhesions. These adhesions or membranes become more marked towards the hepatic flexure and contain numerous delicate bloodvessels which run transversely to the long axis of the colon. The membrane may cover the transverse colon and the sigmoid, but is most commonly seen on the ascending colon.

It is easily stripped off the intestine, leaving usually a smooth surface. J. N. Jackson has given a good description of this membrane (*Tr. West. Surg. Assoc.*, 1908). It is usually so delicate, like a spider web, that I have not been able to assure myself as to whether its removal leaves the peritoneum intact or not.

Hertzler (*Trans. Am. Med. Assoc.*, Surg. Sect., 1909) believes the condition one of "varicosity of the peritoneum" due to a more or less distant inflammation and that the membrane itself consists of peritoneum mobilized by a hyaline degeneration of the subperitoneal connective tissue. However it may be formed, it may cause pressure on the colon and unite the ascending to the transverse colon.

In mild cases of colonic intoxication, where the ptosis is slight and the intestinal musculature is good, some error in diet may be followed by a feel-

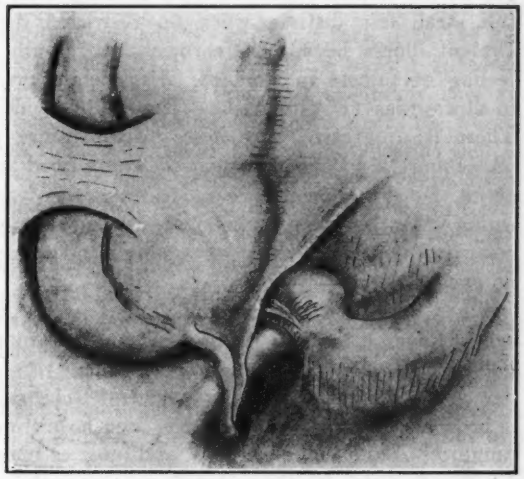

Fig. 6.

ing of tension, weight and pain in the right iliac fossa. In the same region there is borborygmus. On examination the cecum may be felt distended and rumbling. A change in posture or even the pressure of the examining hand may give prompt relief. In any event the attack soon passes off and the patient feels well.

In severe cases more or less acute exacerbations come on without any apparent cause. There is abdominal distension, especially along the line of the colon; painful "dragging" in the abdomen and pelvis; ill-defined discomfort; tenderness and moderate rigidity usually lower than McBurney's point. Fever may or may not be present. There is a history of constipation alternating frequently with diarrhea.

Often there is relief when the cecum is gently pushed upwards and supported. The large intestine, especially the cecum, is felt to be distended and situated low down. Between attacks there is greater or less discomfort and pain. The

general condition of the patient is often pitiable and not pitied. There is usually well marked indigestion—impairment of nutrition to a greater or less extent—neurasthenia is very apparent. The skin is dirty looking and stained, especially about the body folds and around the eyes. The hands and feet are chilly. Perspiration is common and often has a disagreeable odor. Some remote results of the intoxication will be alluded to later. The symptoms are so widespread and confusing that it may be well to study a few illustrative cases besides those I have already given.

E. E., male; age 15; admitted to Bell Memorial Hospital Jan. 26, 1909, complains of loss of weight, gas on his stomach, distress from bloating after a full meal, less distress when on restricted diet. Present illness began in February, 1907, with a feeling of fulness in stomach. His weight prior to illness was 115 pounds, and now is 88 pounds. There is progressive weakness. Temperature is 98. Pulse 72. Patient sleeps well, has a good appetite, but his digestion is so bad that he fears eating. Marked constipation. *Urine* has a high color; sp. gr. 1030; acid; no albumin; no sugar; no excess indican.

Blood examination.—Hamoglobin, 90-100 per cent. Reds, 4,760,000. Whites, 6,600. Polymorphonuclears, 49.5 per cent. Large lymphocytes, 6 per cent. Mononuclears, 21.5 per cent. The skin is brownish in color, but there has been no distinct jaundice. Abdomen is retracted and muscles tense. *Feces* yellowish—faintly acid with evidences of fermentation and numerous trichomonads.

Tuberculin tests negative. The pains are not constant and not great—mostly discomfort. There occasionally is pain in both inguinal regions and under the right ribs. The patient is markedly neurasthenic, has had much treatment, including residence in New Mexico—all without effect. He has no energy, stays about the house, is interested in little but his own ailments and *enjoys* bad health. My diagnosis lay between cholecystitis and colonic intoxication.

March 9, 1909. Laparotomy. Gall bladder and stomach normal. Transverse colon is large, hangs low and is full of feces (this in spite of thorough and frequent flushing). It is covered by a delicate spider web membrane. Ascending colon in same condition as transverse—*has a meson.* Cecum is free from membrane and is mobile. Appendix healthy—not adherent. Removed appendix. Did a cecostomy after the Witzel method.

The operation was borne badly. Immediately after the operation black material was vomited. The patient recovered from the operation and colonic lavage was kept up with disappearance of all symptoms. When lavage was left off for a week or more symptoms reappeared. The tube was removed in the end of December, 1909, after that he became lethargic—lost appetite and had a bad taste in his mouth. The skin again assumed a dirty hue. He had to take laxatives constantly.

May 18, 1910. Patient now weighed 120 pounds. Abdomen reopened. Transverse colon was near pubes and its right, or ascending, portion was covered with spider web membrane. No mesosigmoiditis. Performed ileo-sigmoidostomy, dividing the ileum completely and bringing the distal segment out through the wound so as to be able to wash out the segregated portion of intestine.

The fistula was made in the same fashion as a Summer's cholecystostomy, the walls of the gut being removed after some weeks, and in June, 1911, the patient was in perfect health; cared nothing about his digestion; took no laxatives and played baseball regularly.

I cannot resist the temptation to reprint one of Mumford's cases told in his inimitable style.

"Marion Paoli, at the age of four, had become a confirmed and chronic invalid. I saw her in consultation in May, 1910, when she was under the care of a well-known orthopedic surgeon. She was a victim of 'chronic rheumatism,' and had become nearly blind. She had run the gamut of numerous dispensaries and hospitals, and had received in abundance the conventional joint treatment which such institutions supply, but all without benefit. Her first and most notable ailment was a chronic arthritis, which had been increasing rapidly for the past three or four months, so that her knees were swollen and painful, preventing her from walking, and her wrists also had become involved in the process. For some six months also she had been afflicted with an increasing failure of vision. When I saw her she could barely distinguish light from darkness, and was said to have a form of cataract in both eyes.

"In order to determine the possibility of an intestinal obstruction with a resulting intestinal toxemia, we had the child *x*-rayed. Somewhat to our surprise and greatly to our interest, the *x*-ray demonstrated that the stomach and transverse colon were markedly prolapsed. The splenic flexure, however, seemed to be patent, so that we were left to assume that the obstruction, which undoubtedly existed was probably located lower down, in the region of the sigmoid or rectum. Her mother informed me that her bowels moved not more than once a week, and then only after dosing with large amounts of castor oil.

"So marked and so rapidly progressive a toxemia could be little influenced, we feared, through the wearing of an apparatus by so young a child. It seemed best to us, therefore, to attempt at once a radical operation which should establish effectual, though temporary, intestinal drainage. At that time the problem of intestinal drainage was not altogether clear to us, although we were familiar with the work on that subject made conspicuous by the activities of Arbuthnot Lane, in London. It seemed to me best, however, to establish an artificial anus, and to that end I determined, in the first place, to explore thoroughly the abdomen. On opening the abdomen, on the 14th day of May, I found the cecum and transverse colon prolapsed, as the *x*-ray had shown. The passage from the transverse to the descending colon was clear, but lower down, where the sigmoid flexure passes the brim of the pelvis, there was a sharp kink or twist, obviously the cause of the chronic obstruction. At this point in the operation the child's condition became so bad that I did not feel justified in a further extended exploration. I therefore drew out a loop of the sigmoid and established drainage by colostomy at that point.

"The child did well, the wound healed kindly, and in the course of ten days movements of the bowels were free and abundant through the artificial anus. It was obvious that we had accomplished our object of securing proper drainage. We determined, accordingly, to watch the effect of the experiment to this point; and I call it an experiment advisedly, for the situation had been carefully explained to the parents, who agreed that they would submit their child to any hazard, as it was obvious that under the old conditions her life must be short and increasingly wretched.

"The child's mother took her away to the country for a long summer vacation, and on their return in October, 1910, we were gratified to observe a considerable improvement. The bowels were moving well and the artificial anus was comfortably controlled by dressings. The condition of the patient's knees was distinctly better, the wrists appeared to be but little involved, and there was some slight improvement in the eyesight, judging from general appearances. The child was rosy and active, running about playfully in my office, and avoiding without trouble the furniture in her path. She was able to distinguish colors also, although she could not distinguish individuals. It appeared that the time had now come to undertake a further attempt to establish a more comfortable drainage of the intestines.

"I undertook this second operation with a good deal of hesitancy, as I feared that I should not be able to accomplish much and that the result might well disappoint us. On the 15th of November I explored the abdomen again, opening down through the median line and leaving the colostomy opening untouched. Hardly was the abdomen open before the child began to show the ill effects of the procedure, so that I was obliged hastily to conclude the operation. I could only satisfy the conditions by sidetracking the artificial anus, and this I did by cutting off the ileum at the cecum, and turning the proximal end of the ileum into the lower portion of the sigmoid, below the obstruction which I have previously described. The abdomen was then hastily closed and the child put back to bed in extreme collapse. For some three days it appeared that she would not rally, but eventually she improved, and in the course of two weeks the wound was soundly healed and the child almost as well as ever. For some weeks thereafter we were disappointed by the fact that the fecal discharges issued from the artificial anus (backing up from the lower sigmoid), as well as through the anus proper, but by the middle of December this double flow had become much less, and the child's movements took place mainly through the rectum and anus. Coincident with the establishment of this normal current the patient's general condition improved greatly. Her arthritis disappeared rapidly, so that by the middle of January it troubled her scarcely at all. Moreover, on gross inspection, it seemed that the eyes had improved. At any rate, she went about without hesitation. The case is still under treatment, and a further operation undoubtedly will be necessary, an operation to close the artificial anus and probably to remove a considerable portion of the colon. This operation we shall postpone, possibly for two or three years, as it will be a tedious undertaking, and will be borne better by the patient when she is somewhat older."

Very many cases, even when apparently severe, respond to patient and thorough medical treatment. The principles of treatment are: (1) Support the abdomen, especially the lower abdomen, with a well-fitting binder or lifting corset. (2) Strengthen the abdominal muscles by exercise. (3) Regulate the diet. Avoid foods which leave a large amount of material to be absorbed by the large intestine. Remember that the large intestine is *the* intestine of the herbivora. Buttermilk is of value. (4) Regulate the bowels by rectal flushing, the use of oils and petroleum products (*e.g.*, white vaseline) by the mouth. (5) Use judicious abdominal massage.

If intelligent and persistent medical treatment fails to give satisfactory results then surgical means must be considered.

What surgical measures are available?

In Mumford's case, which has been quoted, the poor condition of his patient led him to establish an artificial anus as a preliminary to more radical work. In the case of E. E. I used a cecostomy for the same purpose and it acted admirably. In a lady of about 60 years of age I have to admit a complete failure. She had suffered from constipation and obscure abdominal pains for many years, was extremely neurasthenic and had been addicted to many drugs. When I saw her she was taking Morph. gr. ½ with Hyoscyamin 1/50 to ease her sufferings. Temperature 101°-102°. Pulse rapid and weak. She vomited much and could take little nourishment. Her appearance was strikingly pale and flabby. In the right iliac fossa there was a large, tympanitic swelling which sometimes almost disappeared and was very tender. Abdominal tenderness and her nervousness made examination most difficult and unsatisfactory. *Diagnosis.* Chronic intestinal stasis with secondary appendicitis. On operation the ascending colon was found covered with spider web membrane. The cecum was in the pelvis and was hard to pull up. The appendix lay curled up between the cecum and ileum and was adherent to the pelvic brim just external to the iliac vessels. The ileum ascending from the pelvis ran parallel to and was adherent to the *caput coli.* The appendix was removed; adhesions divided and cecostomy performed in order that the colon could be flushed. The patient was in an extremely weakened condition and died from septic parotitis.

Was the diagnosis correct? Was the appendicitis primary and the colonic stasis accidental or was the appendicitis secondary to the colonic affection? I incline to the latter opinion.

In less severe cases the operation of ileo-sigmoidostomy is often of value. Mansell Moullin (*Lancet,* January 16, 1909) contents himself with forming a large lateral anastomosis between the ileum and sigmoid but most surgeons divide the ileum between the point of anastomosis and the cecum, either closing both ends of the divided ileum or using the distal segment as a safety valve through which to irrigate the segregated segments of the large intestine.

de Quervain (*Archiv. für Klin.,* 316) objects to ileo-sigmoidostomy because he has found that the patient may subsequently suffer from diarrhea due to psychic disturbances and to indulgence in vegetables. I have not yet met with these. de Quervain also uses the cogent argument that antiperistalsis may undo any good the operation may have done.

Lane, long ago, found recurrence of the trouble after ileo-sigmoidostomy and in many cases excises the colon in whole or in part. The possibilities of antiperistalsis are well illustrated in a report by Willy Bloch (*Zentralblatt für Chir.,* No. 17. 1911). A woman who occasionally suffered from obstruction was given a bismuth meal. The bismuth was only evacuated after 117 hours with the aid of castor oil. The *x-rays* used at intervals showed that a comparatively large segment of the transverse colon emptied itself *twice* into the cecum. de Quervain advocates excision of the ascending

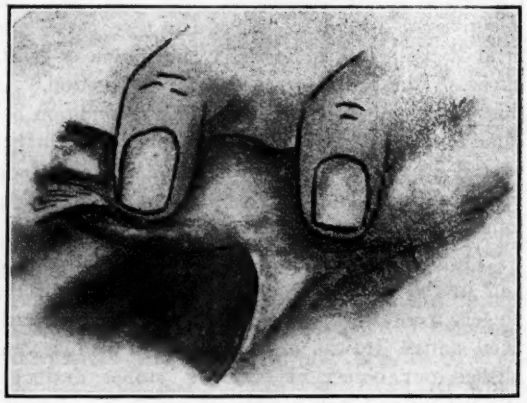

Fig. 7.

and part of the transverse colon. When the fecal stasis, as shown by the *x*-rays, is in the ascending colon he thinks that ileo-transversostomy is better than ileo-sigmoidostomy, but that when the stasis is in the descending colon, ileo-sigmoidostomy is preferable. If the colon is not excised when ileo-transversostomy is performed de Quervain diminishes its lumen by plication and especially exaggerates the hepatic flexure by judicious suturing.

In performing ileo-sigmoidostomy the surgeon must pay particular attention to obliterating any pockets or bands which result from division of the meso-ileum and the formation of the anastomosis. I saw one death from internal hernia from this cause.

Wilms, Klose, and many others, think intestinal stasis is due principally to undue mobility of the cecum and remedy this by anchoring the cecum to the parietes. If the cecum is unusually voluminous Wilms advocates ileo-transversostomy. Many surgeons, on the theory that dilatation of the cecum (typhectasia) is of more importance

than undue mobility, lessen the size of the cecum by plicating its walls or by combining cecopexy and cecoplication.

Roeder (*Journ. A. M. A.*, February 25, 1911), Voelcker (*Zent. für Chir.*, 1911, No. 29), Hofmeister (*Beiträge z. Klin. Chir.*, LXXI, 832) does not believe that mobility of the cecum is of importance in causing stasis, he accuses dilatation of the cecum due to incomplete obstruction of the ascending colon. In recent or less grave cases he endeavors to render the dilated and mobile cecum more mobile by dividing with the cautery all parietocolic folds or adhesions which contract the intestine. In principle this is similar to Jackson's operation in which he strips off the spider web membrane which covers the colon. Jackson has had some gratifying and some disappointing results.

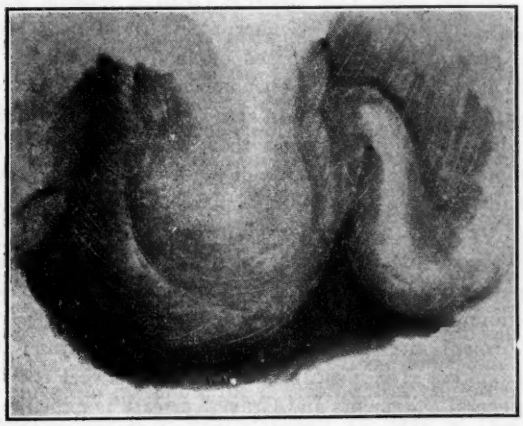

Fig. 8.

As has already been stated, Wilms has reported good results from cecopexy which he performs by reflecting a peritoneal flap in the iliac fossa, laying the *caput coli* on the raw surface thus obtained and suturing the peritoneal flap over the cecum. It seems to me that the good obtained must in some instances at least be due to the necessary straightening of the terminal segment of ileum distal to one of the kinks described. Fig. 8 shows how the prolapsed cecum pulls down the terminal ileum and can cause some degree of obstruction if the ileum is at one point held up by a band, while Fig. 9 shows how cecopexy can do away with the obstruction.

Intoxication from intestinal stasis may have some very serious remote results. In speaking of infective arthritis Goldthwait, Painter and Osborn state that "long standing or acute fermental trouble in the intestine may be a source of absorption and infection."

Knowing that lowered resistance is a prominent factor in the incidence and persistence of tuberculous lesions; that the intoxication from intestinal stasis does lower the general resisting power, and "having observed the sequence of a tuberculous infection on the top of old intestinal stasis in a large number of cases in 1909, Arbuthnot Lane commenced the treatment of advanced tuberculous joints in patients who showed signs of intestinal intoxication by ileo-colostomy" (Chapple, *Lancet*, April 29, 1911).

Distaso, assistant to Metchnikoff, studied the results of the operations after 12 months (*Lancet*, April 29, 1911). He writes:

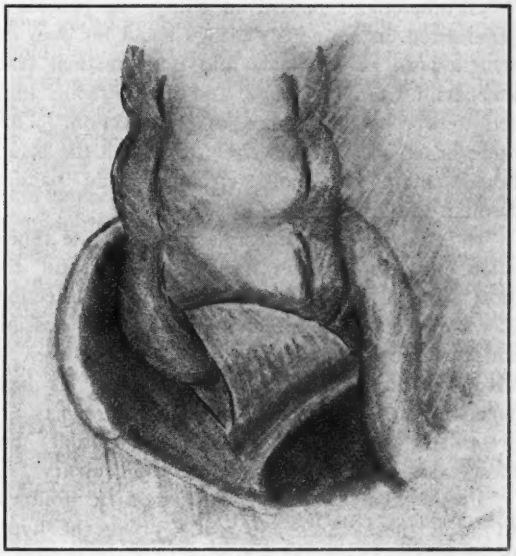

Fig. 9.

"The results are that the children submitted to this operation are in excellent health in spite of the fact that all previous surgical and medical treatments had failed, and exclusion of the large bowel has brought them back to health.

"How to explain these facts that at first sight seem paradoxical? We know that it is almost certain that it is only by the alimentary tract that one can become infected, because it has been clearly demonstrated that the pulmonary route plays a part that is almost negligible in tuberculous infection. So that primary pulmonary tubercle ought to be considered a rarity, and is almost always secondary because the bacilli can pass through the mucous lining of the intestinal wall and are carried by the blood stream to the lungs. We know, on the other hand, that localized tubercle is curable, whilst generalized tuberculosis is not. What is the cause of this fact? The most reasonable hypothesis

is that the individual is rendered sensitive by the first infection to a second infection. The experiments of Nocard demonstrate the possibility of the truth of this supposition. He isolated calves infected with tubercle and found that they recovered; on the other hand, calves similarly infected which were not isolated, but exposed to the possibility of additional accidental infections, did not recover. In other words, the possibility of a re-infection is the salient point in tuberculous patients. The method of isolation practised in sanatoria, and the giving to the patients of sputum cups instead of allowing them to use handkerchiefs, are the practical outcomes of this view.

"A tuberculous patient in whom the process is generalized unconsciously brings about his own destruction as he swallows into his intestinal tract the bacilli from his lungs, and thus submits himself to a constant source of re-infection. Thus there is set up a vicious circle, in which the bacilli become more and more virulent while passing through the organism.

"It is in the large intestine in which the tuberculous process localizes itself that we find the most suitable circumstances for this re-infection. If we exclude it, re-infection is no longer possible and the individual should thus be cured even in advanced cases. This is exactly what has happened in these children whose clinical reports are presented. They were considered incurable, but these cases have demonstrated to the contrary.

"From what we have just said it follows: (1) that these cases apparently prove the hypothesis that the route of infection of the tuberculous virus is via the intestine; (2) that a tuberculous infection is only curable when re-inoculation is prevented, and (3) that advanced tuberculous lesions can be cured if we remove the disposing cause. This brings me to speak about the problem of tuberculosis. We know that a large number of people at necropsy show tuberculous lesions and yet that in a large percentage the lesion was not fatal. so that we must look for other causes that make this disease such a veritable scourge. These predisposing causes are alcoholism, syphilis, constipation and other things. Especially must we consider constipation with its predisposing effects in favor of the tubercle bacillus because it permits fecal stasis and consequently brings about the most suitable conditions for the development of all the organisms found in the intestinal flora in these cases, with the results that (1) the possibility of the penetration of the intestinal wall by the tubercle bacillus is brought about; and (2) there is associated the auto-intoxication produced by the putrefaction of the intestinal contents brought about by the condition of stasis.

"These deductions we shall put to the test in the laboratory, but we do not wish to touch at present on the subject of immunity. It seems probable, however, that in most cases the individual forms antibodies in response to inoculations by tuberculin, but these do not cure the tuberculous process."

Mumford (*One Hundred Surg. Problems*) gives similar evidence.

SURGICAL ASPECTS OF GRAVES' DISEASE.

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In the Ether Day Address (*Boston Medical and Surgical Journal,* December 15, 1910), I proposed a general hypothesis based on biology which harmonized many of the phenomena concerned in the origin, cause and treatment of Graves' disease. This hypothesis assumes that man is primarily a motor being; that environment activates the brain, and the brain in turn acts upon the various organs of the body. When the brain receives an adequate stimulus and there is no restraint a motor act is performed; when the brain receives an adequate stimulus, but because of inhibitions no act is performed, the resulting phenomena constitute an emotion. The probable connection between these general statements and Graves' disease is explained in a paper read before the Medico-Chirurgical Society of Baltimore and published in the *Medical Chirurgical Bulletin.*

Now whatever the connection between the activation of the motor mechanism and Graves' disease, it is obvious that in Graves' disease there is a hyperactivity of the motor mechanism leading to exhaustion. Viewed from every standpoint, viz.: that of pathologic physiology, pathologic morphology, etiology, clinical course, treatment and convalescence, the motor mechanism is in a state of hyperexcitability, and the whole picture is that of exhaustion. The phenomena of Graves' disease are almost identical with the emotion of fear. Now what drives this motor mechanism? Physical injury, emotional excitation and thyroid secretion drive it. Among these influences that drive the motor mechanism the emotional excitations most frequently play the leading role as the exciting cause and must be reckoned with in the clinical course and treatment.

Hence it is that in so many cases Graves' dis-

ease follows in the wake of an emotional strain, fear, worry, grief, disappointment, overwork, anxiety, especially when these excitations occur during one of the great rhythms of increased activity of the thyroid, viz., in younger unmarried women and in pregnancy. On this hypothesis we can understand the production of Graves' disease by the administration of excessive doses of thyroid extract.

On the assumption that in Graves' disease there is an increased activity of the thyroid, and a hypersusceptibility of the nervous system to thyroid extract, as well as to traumatic and emotional excitation, we have the key to the treatment. If the brain can be so completely put at rest that its hyperexcitability is lost and normal control established the disease is arrested, the thyroid gland shrinks, the excessive vascularity disappears and there is body-wide improvement. But if a rest cure fails, then the next indication is the reduction in the pathologic activity of the thyroid gland, either by interrupting a part of the nerve supply and blood supply or by removing a part of the gland. How do we know that a reduction of the activity of the thyroid causes an improvement in the disease? We know this because the symptoms begin to diminish on the day following the operation and progressively continue to diminish until the patient is relatively or wholly cured of the disease. Now some cases do better than others. What factors cause this difference? If the surgical treatment has been deferred until serious organic changes have occurred in the brain, the heart, the liver and other organs, then it is the wreckage we have to deal with and there is no possibility of restoring what has been already destroyed. But even in these cases the active process may be arrested and the remnants of the patient saved. But there is another factor, sometimes a serious factor that works against a complete recovery; that factor is the unfavorable environment of the patient, usually some social disturbance, *e.g.*, emotional excitation caused by sickness or death in the family; quarrels or differences especially in the family circle; impending financial disaster; the worry and overwork on account of poverty; sentimental disappointments; and so on through the entire gamut of depressing nerve strains.

There is still another factor which goes far toward facilitating or hindering the clinical cure; that is the technic of the operation.

This point will be further discussed later. Turning now to the operation, we at once are confronted with this important condition: We have to do with a patient hypersensitive to injury and to emotional stimulation. Any operation in a normal subject may be attended by fear; all operations as usually performed originate traumatic stimuli, which reach the brain; but in Graves' disease we have to deal with a brain enormously sensitized; in some cases the brain may be a hundred or more times as sensitive as the normal.

Trauma or emotional excitation are remembered, either consciously or unconsciously, for a long time, and each time the strain of the operation is recalled the patient is subjected to a damaging emotional stimulation, as damaging as if the stimulus were a new emotion, a new strain or a new injury. Now, if one could remove the gland without emotional excitation, and without either conscious or unconscious pain impulses reaching the brain, the patient would then be left in the ideal state for a maximum rate of recovery. Happily we now have a plan whereby the operation may be relieved of its stigma; that is by the technic of *anoci-association.*

By this is meant the following: The patient presents himself for operation. By especial management of the patient prior to the operation; by anesthesia without emotional disturbance; and by the use of the pleasant nitrous oxide—oxygen anesthesia; and by local anesthesia, the whole operation is so managed that the brain does not receive either emotional or traumatic stimuli; hence the patient's condition is the same at the end of the operation as when in bed before the operation. By this method the vitality of the patient is remarkably preserved.

Another—and a most important point—is the clinical judgment as to the extent of operation to be performed, whether it is best to ligate one vessel or two vessels, or whether one might excise a lobe at the first seance. The factors that make up this judgment are based on personal experience and must be individualized by each operator for each patient; hence, it is idle to try to describe the conditions for each.

We now reach the crucial point, viz., what is the operative risk? In my earlier cases, while using the technic for colloid goitre and when I had too little experience to form a fair judgment, the mortality rate was high. But increasing experience and newer methods have reduced the mortality to approximately 2 per cent. at the present time.

A study of the post-operative course of my patients showed that the recovery proceeds along a course analagous to that which follows a nervous breakdown, to a major sorrow and a crushing disappointment. Re-education in the philosophy of life should be a part of the after care. The ideal

conditions for cure are diverting travel, automobiling, nature study—any new interest unrelated to the former environment.

The post-operative course of my patients showed that every patient was ultimately either improved or cured; the maximum improvement is usually reached at the end of a year; relapses are almost always associated with some unusual nerve strain.

PRACTICAL POINTS IN THE SURGICAL TREATMENT OF EXOPHTHALMIC GOITER.

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During the last quarter of the past century an interesting experience has repeated itself many times in the practice of clinical surgery because the same general conditions have recurred whenever a disease has been transferred from the field of internal to that of surgical treatment.

In each instance much knowledge had been accumulated concerning the etiology, symptomatology, pathology and course of the disease as a result of the observations of the clinicians engaged in the practice of internal medicine during the past centuries. As a rule, however, all views concerning the living pathology were based upon theory and upon post-mortem findings, because the actual condition could not be inspected so long as the treatment was confined to non-surgical methods, except in rare instances in which death occurred from some accidental cause not connected with the disease under treatment.

With the advent of surgical treatment the important element of living pathology has been introduced, in each instance very commonly with the effect of causing much confusion, because too often we have been misled to believe that so serious a condition as we found during operation in the particular case under consideration could not possibly have resulted in recovery had we not assisted nature by removing the diseased tissue by surgical interference. This has resulted in clouding the indication for operation in almost every condition in which surgery has replaced internal treatment. As a result of this erroneous conception we have usually erred in two entirely opposite directions; we have operated unnecessarily in some cases which would have recovered spontaneously, and, on the other hand, we have operated on cases which could not carry the shock of the operation in connection with the burden of an acute attack which would, if left to nature, subside spontaneously.

This has again been true regarding the surgical treatment of exophthalmic goiter, and in this as in every other field of surgery, errors which belong to this class can be eliminated only after an enormous number of observations have been made by individual surgeons. So long as no surgeon has personally accumulated a very large experience, many important practical points must remain vague.

It is my object to discuss a number of practical points, mostly gleaned from the current literature on this subject, but bearing upon this feature, all of which I have carefully tested in a large number of cases, so that I am convinced that by their introduction the danger can be reduced materially and the efficiency of surgical treatment can be correspondingly increased.

1. *Indication for Operation.*—In a general way the indication for operation in these cases may be stated as follows: Surgical treatment should be employed in every case which does not recover permanently upon treatment with rest, hygiene, diet and the use of a few harmless remedies, and possibly also the treatment with serum, provided, first, that the patient is not suffering from temporary exacerbation of the hyperthyroidism, and, second, that the condition has not existed sufficiently long to leave the circulation and the nervous system of the patient in an absolutely hopeless condition. Unless one recognizes the first of these contraindications one will lose patients who could easily bear the strain of the operation were they not also compelled to bear the additional strain of the temporary hyperthyroidism. This can be avoided by waiting until the temporary storm has subsided. In the vast majority of these cases one will find that such exacerbations have repeatedly occurred before, only to subside again under treatment with physical, mental and emotional rest, proper diet and internal treatment. Of course, the patient emerges from such an attack each time in a worse condition than the previous time, consequently one shows better judgment by avoiding operations during an attack of acute hyperthyroidism.

2. *Margin of Safety.*—Many of these patients have only a very slight margin of safety, consequently it is important to plan the operation in any given case so that it will not exceed this margin, even though the amount accomplished may not be

sufficient to cure the patient without further operative treatment. It may, for instance, be plain that one entire lobe and a part of the other must be removed in order to cure a patient, but the latter's condition may make it wise to remove only one lobe or possibly to ligate one or two vessels, and later to add the remaining treatment as the patient's condition may indicate that the margin of safety will not be transgressed by this additional strain.

3. *Drainage.*—This is undoubtedly another important means of reducing possible post-operative hyperthyroidism. The more thoroughly hemostasis has been secured during the operation the less necessary will the drainage be, but there is practically always a sufficient amount of serum secreted to indicate the use of good drainage.

4. *Traumatism Increases Hyperthyroidism.*—Traumatism undoubtedly increases hyperthyroidism, and consequently it is extremely important to guard against violence in connection with the operative manipulations. The anatomical conditions encountered in this operation make it possible to accomplish the excision of the diseased gland without the necessity of crushing or otherwise traumatizing the gland tissue if proper operative technic is employed. There is a marked difference after operation in patients who have been operated upon with the greatest degree of gentleness of manipulation and those who have been manipulated roughly during the operation.

5. *Anesthesia.*—The careless use of anesthetics in this operation is one of the greatest dangers, because of the slight margin of safety, and because of the poisonous effect of all anesthetics except ether; also because of the fact that respiration is often interfered with to some extent by the manipulations of the operation, and because mucus is likely to accumulate in the larynx during the operation.

One per cent. of cocaine injected carefully into the skin along the line of incision and along the course of the nerves supplying the field of operation will avoid the necessity of an anesthetic, and has the advantage of compelling the surgeon to be gentle in his manipulations, but it has the disadvantage of operating with the patient in a conscious condition.

If one-fourth of a grain of morphia and one one-hundredth of a grain of atropia is administered hypodermatically half an hour before the operation is begun, and the patient is then thoroughly anesthetized with ether by the drop method, and if then the head of the table is elevated so that the body lies at an angle of 45 degrees, the operation can be completed without the further administration of ether. This makes the use of ether perfectly safe, and the patient's pulse regularly improves during the operation. The jaw must, however, be held forward by a reliable assistant during the entire operation in order not to permit the tongue to obstruct respiration by falling back into the pharynx.

6. *The Necessity of Avoiding Injury* to the recurrent laryngeal nerve, to the parathyroid glands and the trachea is so fully established that this requires no reference. Neither is it necessary to mention the importance of leaving a sufficient portion of thyroid gland tissue to prevent the production of myxedema.

7. *Supply of Liquid.*—Immediately after the operation it is well to supply an abundance of liquid to the patient in the form of hot water taken by mouth, or normal salt solution given as an enema by the continuous drop method, or if neither of these methods can be applied, by subcutaneously injecting normal salt solution into the tissues underneath the breasts. This is especially useful for the relief of post-operative hyperthyroidism.

8. *After-Treatment.*—Not a week passes but that I am consulted by some unfortunate patient who considered herself so completely cured by the removal of an enlarged thyroid gland that she proceeded to indulge in the same physical, mental, emotional and dietetic excesses which were practised before she became ill, and which may have had much to do with the primary disease. In many cases alcohol, tobacco, tea and coffee have been used to excess.

It is extremely important, therefore, to give these patients definite directions to avoid overwork, excitement, alcohol, tobacco, tea and coffee, late hours, social and business worries, absolutely and permanently, after recovering from the operation, and to select a diet largely composed of milk, cooked vegetables and fruits.

9. *Youthful Patients.*—It is well to bear in mind that especially in young girls, about the time of puberty or a little later, many goiters cause symptoms which will justify a diagnosis of incipient exophthalmic goiter. The tremor, the muscular weakness, the nervous excitability, some tachycardia and many of the minor symptoms are often present. There may even be present a very slight degree of exophthalmos, and still these patients will almost invariably recover without operation with physical, mental and emotional rest, a diet composed largely of milk, cooked vegetables and fruits, favorable hygienic surroundings and absence of

conditions which might cause nervous excitement. It is well to bear this in mind because it will prevent many unnecessary operations.

2106 Sedgwick Street.

THE CONTROL OF BLEEDING IN BRAIN OPERATIONS.

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The control of hemorrhage from vessels of the scalp and skull may become, under certain conditions, an embarrassing problem. Fatal hemorrhage from these structures is indeed rare, but the loss of a large quantity of blood, combined with other depressing factors incident to a long brain operation, may determine the occurrence of alarming symptoms, or even death.

It is established as a surgical principle that neat and precise hemostasis facilitates the performance of a neat and precise operation. In view of these facts, the writer here presents a brief description of a few more or less original technical contrivances which have proven helpful in controlling bleeding in head operations.

A distinguished article upon this subject by Dr. Cushing, of Baltimore, appeared in the July number of the Annals of Surgery.

Position.

In all operations upon the head, position is an important factor. Hemorrhage can be decreased notably by maintaining the head at such an elevation that the field of operation is higher than the patient's trunk. Experience has doubtless taught most surgeons that the head-hanging posture or even the horizontal position will increase bleeding and increase the danger to the patient, as well as the technical difficulty of operation.

Elastic Constriction.

It is the practice of many operators to place an elastic band tightly about the skull, approximately along Ried's base line, before craniotomy. I am not sure that this practice is always justified. Not infrequently the increase of venous hemorrhage, owing to the presence of the elastic circlet, is greater than the decrease of arterial hemorrhage which results from the constriction. In such a case the removal of the constricting circlet promptly reduces the bleeding.

In brain tumor with compression of the large sinuses, the venous engorgement may be communicated to the diploe and to the scalp veins through the medium of the numerous emissary veins of the skull, and in such a case the tourniquet is of doubtful usefulness. The elevated position will usually do more to check such venous hemorrhage than the elastic encircling band.

I wish not to be misunderstood as saying that the elastic band should be discarded, but rather that in such cases in which its presence renders the scalp blue with turgid veins, it should at least be temporarily loosened or removed, to the end that the effect of such loosening upon the hemorrhage may be noted.

I have used as an elastic constricting circlet an ordinary annular rubber band, such as is applied about a large wallet. One or two broad rubber circular bands of the common stationer's kind may be snapped on and off much more conveniently than rubber tubing or an Esmarch's bandage.

Gauze Pads Under Elastic Circlet.

In order to bring greater pressure to bear where it is most needed, the placing of gauze pads under the rubber band and over the temporal, posterior auricular, and occipital, or other large scalp arteries

Figure 1.—Punch for condensing the margin of diploe to arrest bleeding.

may be practised, though this is a matter of minor importance.

Control of Hemorrhage in Flap.

The bleeding from a scalp flap whose base is not excessively broad may be controlled readily by catching the base of the flap between the jaws of rubber-covered forceps. The control of the hemorrhage here is prompt and efficient, and unless brutal, crushing forceps are used there need be no danger of devitalization of the flap. The danger of destroying the flap is certainly not greater than the danger of destroying the vitality of the intestine with similar forceps whose jaws are springy and yielding. Applying light rubber-covered forceps to the base of the flap removes the need of biting and bruising the margin of the flap with toothed hemostatic forceps. It is needless to say that such injury to the flap margin as is incident to the application of strong hemostatic clamps militates, in some degree, against prompt and precise wound healing.

Bleeding of the Diploe.

Hemorrhage from the diploe usually requires no special attention, but if this bony structure be extensively developed and highly vascularized, hemorrhage from its gaping canals may be very annoying and even alarming. Pressing Horsley's wax

into the openings of the diploe may suffice to control this bleeding, or warm, soft, sterile gum chicle may be pressed into the openings. I have found the chicle to be more tenacious than the wax, but it is not absorbable and must be removed before the closing of the wound.

USE OF WOODEN PEGS.

On several occasions in the writer's experience, a threatening hemorrhage from a large canal of the diploe has been controlled by inserting into the opening from which blood was streaming the pointed or conical end of a previously boiled soft pine stick. Such small wooden pegs have proven very useful in closing foramina communicating

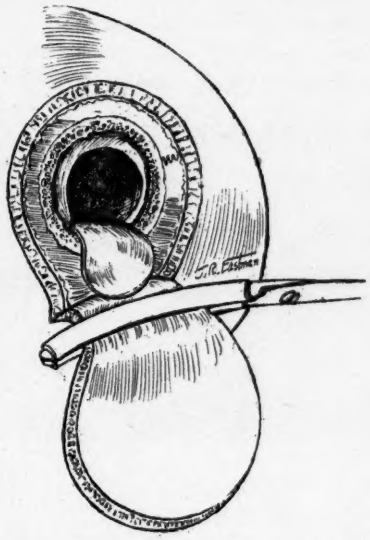

Fig. 2.—Rubber-covered forceps applied to base of flap for control of hemorrhage.

with intra-cranial sinuses. It is a crude practice, perhaps, but one which will occasionally check an embarrassing hemorrhage. The small pointed pine sticks, which are approximately the size of a match, may be completely sterilized, and after their tapering ends have been thrust into the bleeding foramen, may be cut off with bone forceps, and thus not left to project and to clutter the field of operation. They should be removed after coagulum has formed.

CONDENSING THE DIPLOE WITH A PUNCH.

The writer has for several years used a punch-like instrument for the purpose of tamping or condensing the diploe, in order thus to control hemorrhage from this structure. The crushing of the exposed ring of diploe by light blows with this blunt instrument has often proven of considerable service in the arrest of hemorrhage from the spongy layer of the cranial bones.

There has recently appeared a somewhat similar instrument designed for the same purpose and known as Passow's blunt chisel. Krause (*Surgery of the Brain and Spinal Cord*) describes still another method for the arrest of bleeding from bone canals. He passes a so-called bone hook into the opening. "The Krause bone hooks are made in three sizes and were originally employed for the arrest of bleeding from the middle meningial artery. The hook is introduced into the bleeding point and twisted back and forth several times. If the bone is of sufficient thickness and the bleeding vessel not too large the hemorrhage is controlled by this measure."

HEMORRHAGE FROM MARGIN OF DEFECT IN SCALP.

The scalp flap is usually so cut that no important arteries need be severed. The flap, wherever possible, is cut with the base downward, so that the vessel supplying the flap area enters the base of the flap, the horseshoe incision arching over its branches, so that the flap incision rarely bleeds profusely except from the flap itself. Often the hemorrhage from the cranial side of the flap incision is negligible, or may be controlled readily by compression with a gauze roll.

If hemostatic forceps are used, they should be applied to the bleeding vessels accurately, care being taken to avoid crushing of the wound margin. T-forceps and such special instruments as Carr's scalp hemostatic clamp are sometimes used to control the bleeding on the undetached side of the scalp wound. Carr's instrument is so constructed that it can inflict very little, if any, damage to the wound edge.

THE AUDITORY CANAL IN MASTOIDITIS.

During the last four or five years a large number of cases of atypical mastoiditis have come under my observation. In most of these the condition characteristic of the process was the appearance of the fundus of the canal. A pronounced sinking of the upper and posterior wall of the external auditory canal, or sometimes an elevation of the floor of the canal, in cases of considerable duration, has been the most constant symptom of a mastoiditis. We are warranted in assuming that the conformation of the external auditory meatus, upon the two sides, will be similar, unless some pathological condition exists. If, then, we can exclude bony growths, or an inflammation of the outer portion of the external auditory canal, that is, a furuncle, any narrowing of the meatus upon one side is strongly suggestive of involvement of the mastoid cells.—E. B. DEUCH, in the *Interstate Medical Journal.*

ARTIFICIAL TENDONS AND LIGAMENTS OF SILK IN THE SURGICAL TREATMENT OF THE PARALYSES.

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The aim of surgical treatment where the relief of the effects of a paralysis is at stake is either to furnish improvement in muscle balance or to produce stability in the palsied member. The operations which are designed to restore muscle equilibrium are *nerve anastomosis* and *tendon transference.*

Of nerve anastomosis it may be said that it is the most recently added surgical measure, and that it is the nearest to the ideal, aiming as it does at a complete re-establishment of muscle balance. Though it is an operation which does not require exceptional surgical skill for its performance in general, it is nevertheless one that demands more than ordinary ability to choose the proper case for its employment. Comparatively few operators have had much experience with nerve anastomosis, due to the uncertainty which exists regarding the outcome, this depending upon the regeneration of nervous tissue after the operation has been done.

Tendon transference is an older and more thoroughly tested measure. The epoch started by Nicoladoni, when he sutured an active muscle tendon to the tendon of an inactive one, has produced many important technical ideas. Before this period surgeons were content with deformity corrections and braces.

Although these two things are recognized as essential to-day, they are regarded as steps, and not as all that should be done. The Nicoladonian tendon graft passed through a thorough clinical trial and its fundamental error has been recognized and corrected, so that in tendon shifting to-day only its basis of power transference is practised. The class of cases which are suitable for tendon transference includes only those that have strong functionating muscles, the power of which may be transferred to points of greater mechanical advantage. Lange, who has given us a large part of our present technic, says that for a successful result on a paralyzed foot he must have three healthy muscles at his disposal. One of these must be a plantar flexor, one must be a dorsal flexor and supinator, and the third a dorsal flexor and pronator after the operation, thus insuring muscle balance. Failure to recognize the principle upon which this is based has led to many a disappointment after tendon shifting has been done.

The operations designed to produce stability are *arthrodesis* and *artificial ligaments.*

For those cases that possess too little remaining power to justify either nerve plastic or tendon shift an operation must be done which will produce stiffness in the weakened, or flopping articulations; one that will give the individual a stable prop to progress upon.

Arthrodesis has long been employed for this purpose. Although it is a justifiable operation in a small class of cases, it is recognized by most surgeons who have had experience with its results as being destructive and irrevocable. The plausible objections to it are that it is liable not to produce an improvement which will compensate for the damage done. Aiming, as it does, to destroy a joint both functionally and anatomically, it implies

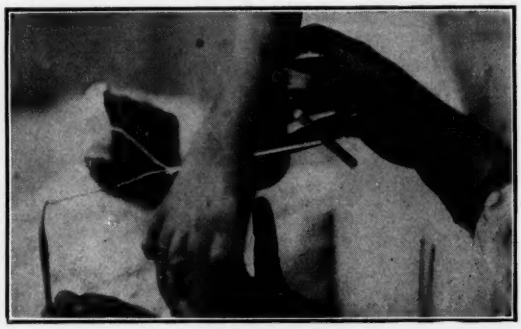


Figure 1. The first step of operation: Drawing the silk through a hole drilled through the tarsal bones.

adaptive changes throughout the entire limb involved. If done before well-established, bony growth, ankylosis does not result. If, as has been recently claimed, there is always some power of improvement in muscle strength in these cases, then the operation of joint ablation may prevent the best ultimate result. Cogent as these reasons are for abandoning arthrodesis, there are nevertheless some conditions to which it is suited. These should be carefully selected, and in them the operation should be done as a last resort. To produce similar results, joint pegging and nailing has been resorted to; but the results have been unsatisfactory, the ivory pegs, or wire nails, having either broken off or worked out in most cases.

It is with the implantation of artificial tendons and ligaments that this paper is concerned, these operations giving the best chance of success in the cases that need to have an artificial stability established.

Auger, in 1875, reported the use of a piece of silk thread as an artificial tendon. In his operation he simply elongated a cut tendon with a silk strand

and found that the silk healed in and that normal function returned. There then followed many experiments on animals and on man, which clearly showed that silk is a suitable material for this use, possessing sufficient tensile strength, and being capable of sterilization.

Lange has been the chief investigator in the surgical use of silk. To him we owe the elongation of tendons by silk cords in the paralyses, and also the technic of periosteal insertion. In 1903 he suggested the use of silk as artificial ligaments. The operation consisted in inserting under the skin, deep in the adipose tissue and near the joint capsule, seven or eight silk threads on each side of the ankle, attached above to the tibia and fibula, and

Figure 2. The second step: Inserting the threaded probes into the sheaths of the tibialis anticus and peroneus tertius muscles.

below to the scaphoid and cuboid. This operation accomplished the checking of a drop foot at a right angle to the leg.

Ryerson has improved upon this operation by passing the silk cords one on each side, up the sheathes of the tibialis anticus and peroneus tertius, respectively, the advantage gained being the insertion of the artificial ligaments under the annular ligament of the ankle.

Burton and Plummer have recently advised the placing of silk check ligaments within the articulations, holes being drilled through the bones and the joint surface being snugly apposed. This has been done at the ankle and knee, and seems to promise a reliable result.

In the consideration of silk implants in the tissues of man the question arises as to the fate of the silk. Does it remain an inert, foreign body within the organism? Do the tissues attempt to organize it, or is there from the start a tendency for the tissues to be rid of the implanted material?

There is an extensive literature on experiments done to answer these pertinent questions. Lange, after many operations and experiments, says that the silk is surrounded and penetrated by a very firm and thick connective tissue which has thoroughly grown together with the silk, thus guaranteeing the durability of the artificial tendon, or ligament, and showing us that we may cultivate connective tissue in places where we need it.

Sever has recently shown, in an excellent summary of the literature, and by his own experiments, that the peritendineum is the important structure for proliferation of new tendon, and that silk may be used as a director for new tendonous growth, which new growth will penetrate and permeate the silk.

In order to possess silk that will be retained and that will act as a director of new fibrous growth in

Figure 3. The third step: The threaded probes making exit at the anterior surface of the leg.

the tissues, it must be properly sterilized. To this end the observations of Lange are of interest. Lange found that silk sterilized in pure water would become infected in the tissues after it had remained quiescent for considerable periods; he then proceeded to incorporate within the silk a stable amount of bichlorid of mercury. This was done by boiling the silk twenty minutes in one to one thousand bichlorid solution. He has also recommended paraffin coating the silk and draining the wounds for a few days after the operation. As his experience has been the greatest, his advice cannot be passed over lightly, but it has seemed to the writer and to several other observers that the paraffin step is unnecessary, and that the draining of wounds adds a danger of infection. It has been my custom to boil the silk shortly before operation in one to one thousand bichlorid solution and then use it directly. In no instance has it caused trouble. It seems wise to say, however, that operations of this nature call for a most careful surgical technic, as regards both cleanliness and the handling of tissues.

The operations here described are simple in character and are designed to produce stability about

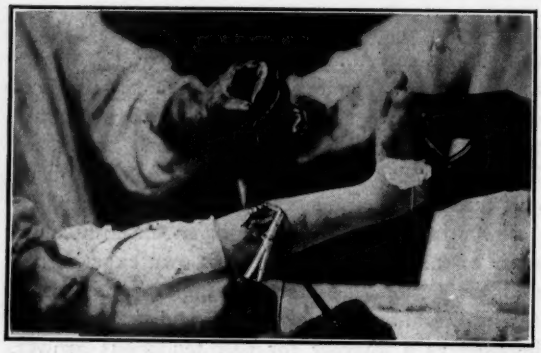


Figure 4. The fourth step: Stitching the silk to the tibial periosteum.

weakened or flail joints, without preventing a limited amount of joint function. They also serve the important role of relieving over-stretched and weakened muscles from the force of gravity, or from antagonistic pull, this latter consideration being one of prime importance in certain forms of flaccid paralysis.

Operation I. Suspension of the anterior foot for paralysis of the anterior leg muscles, with foot drop.

Through a small incision at the inner border of the foot the tibialis anticus tendon is exposed as it passes under the internal cuneiform, and the sheath of the tendon is opened. Through a similar small incision on the outer border of the foot the peroneus tertius tendon is exposed and this sheath opened. A small drill with an eyelet at its end is now passed through the anterior row of tarsal bones from one incision to the other. A silk cord is threaded into the eye of the drill and the drill is withdrawn. One end of the silk is now threaded into the eye at the end of a long, flexible probe, and the other end of the silk is threaded into a similar probe. One of these probes is now passed upward in the sheath of the tibialis anticus tendon, and the other upward in the sheath of the peroneus tertius tendon. The ends of these probes may now be felt on the outer border of the tibia, above the middle of the anterior leg. Through a small, longitudinal incision made here the silk is unthreaded from the probes and they are withdrawn. The foot is pulled up to the desired position of dorsal flexion and the silk is either sutured to the tibial periosteum or to the bone itself. The wounds are closed and a plaster dressing is applied. The latter dressing must relieve the tension of the silk cord.

Figure 5. The fifth step: The wounds closed, the artificial ligament holding the foot at right angle to the leg.

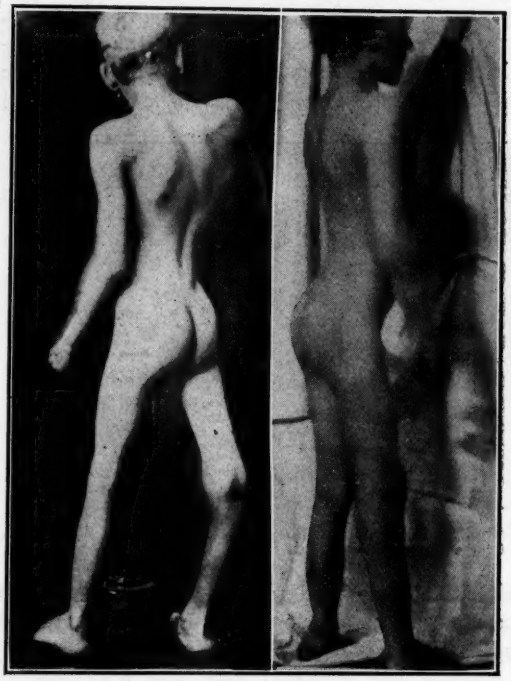
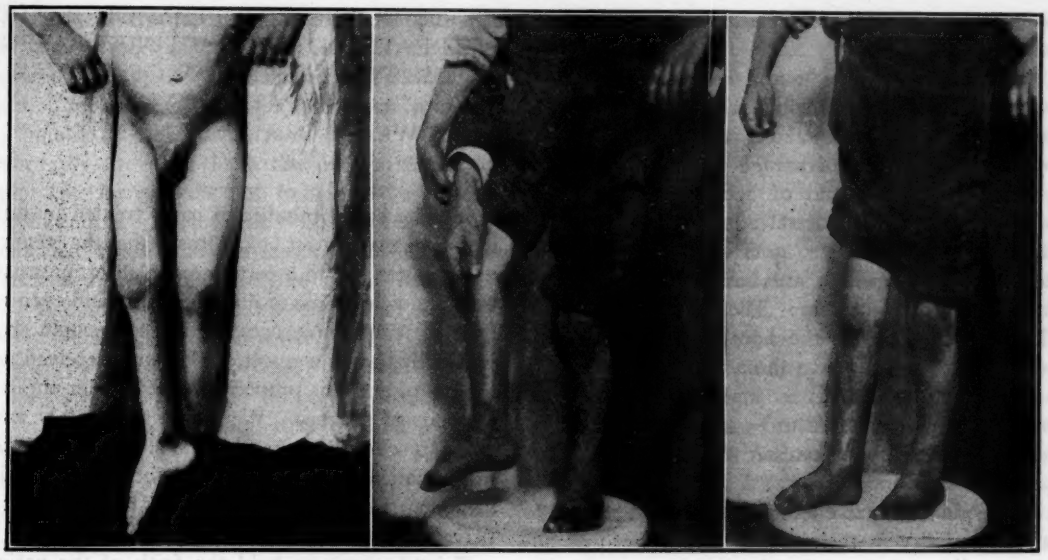


Figure 6. A case of poliomyelitis, with paralysis of the hamstring muscles. Here the hyperextension of the knee, shown in the picture before treatment, was checked by artificial silk tendons as shown in the picture after treatment.

Operation II. Heel suspension for paralysis of the calf muscles, with calcaneous position of the foot.

Through an incision made on the sole of the foot, over the os calcis, a small drill, with an eyelet at its end, is passed through the inner side of the os calcis upward, making its exit on the inner side of the tendo Achilles. The silk is threaded into the eyelet and the drill is withdrawn. A similar drill hole is made from the outer side of the tendo Achilles, through the os calcis, and into the wound below, the silk is threaded into the eyelet of the drill and the drill is withdrawn. This gives a loop of silk through the os calcis, the distance between the drill holes being, at least, half an inch. From the upper inner incision a threaded probe is now passed



Before operation. After operation.

Figure 7. A case of poliomyelitis, with flail ankle. In the photographs taken after operation the improved stable position of the foot can be noticed; also the presence of the artificial tendo Achilles.

upward in the leg, following the course of the tendo Achilles, and then being directed anteriorly toward the anterior tibial surface. A similar threaded probe is passed from the outer incision, up the course of the tendo Achilles, and then forward through the interosseous membrane of the anterior external tibial surface. These two probe ends are now cut down upon and the silk is renewed and the probes withdrawn. The desired amount of tension is put upon the silk cords, drawing the heel well upward, and the silk is sutured to the tibial periosteum, or to the bone itself. The wounds are closed and a plaster-of-Paris dressing is applied.

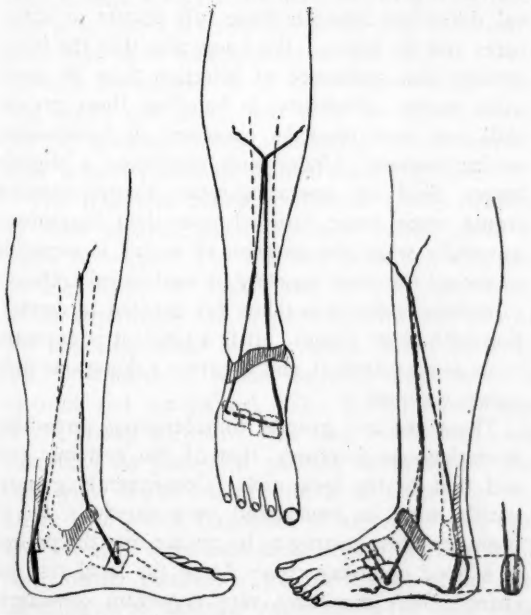


Figure 8.—Diagram showing the anatomical situation in which it is desired to place the artificial ligaments in anterior foot and heel suspension.

Operation III. Anterior foot and heel suspension for flail ankle, with or without pes cavus.

The object of operation here is to supply stability to the ankle joint, the foot being held at right angles to the leg.

As a preliminary step, if pes cavus is present, the plantar tissues should be thoroughly divided. Both operation I and operation II are now done, and the foot is thus held between the anterior and the posterior silk suspension in a right angled position.

Operation IV. Artificial ligaments at the knee for hyperextension of the knee, following hamstring paralysis.

Just below the tibial tubercle the anterior surface of the tibia is exposed. Here two strong silk cords are sutured to the periosteum, or to the bone. Two of these silk cords are passed upward behind the knee, on the inner side, in the sheath of the semitendinosus. The two outer cords are passed upward in the sheath of the biceps. The probes carrying the silk are curved, so that their direction will be forward and will bring them out on the anterior surface of the femur, above the middle of the thigh. Here an incision is made and the probes carrying the silk are discovered. The silk is removed from the ends of the probes, the probes are withdrawn and the silk sutured to the femur, the knee being flexed at 15 to 20 degrees. The

wounds are closed and a plaster-of-Paris bandage is applied.

There seems to be a considerable number of variations which may be made of the use of silk for purposes similar to those just described. The operations have the advantage of being easily and quickly performed, and of being based for their effectiveness on the normal anatomical pull of the tendons. There are two questions which must be considered, and which are now receiving experimental attention, namely: The effect produced by the silk implanted in the bones, and the reaction of the tendon sheaths to the artificial tendons.

My present experience covers a considerable number of cases and dates back to one year and a half ago, when the operation of anterior foot suspension was first performed. Since then some twenty-odd cases have had the method employed, to afford stability at their ankles in one form or another. But one case has been operated upon to check hyperextension at the knee. In none of these cases has the silk shown any tendency to come out, nor has there been an infection.

The after-treatment of these cases should be carefully overseen for at least a year. Plaster-of-Paris dressing must be worn for the first six weeks. After this braces may be supplied which will support the limb and protect the artificial tendons from undue stress, the idea here being to allow a sufficient period of time for the production of fibrous tissues in sufficient quantity to insure permanency of the support.

THE PREVENTION OF ADHESIONS.

The prevention of adhesions is much more satisfactory than the cure, and the main points to be borne in mind are the following:

By complete control of bleeding surfaces there is no chance for the formation and organization of a clot between the loops of the bowels or in the pelvis. Care should be taken to have complete hemostasis in the abdominal wound. Oozing surfaces in the abdomen can often be checked by hot salt sponges or by the sterilized powder of subsulphate of iron as suggested by Kelly. Rough handling of the bowels is not only productive of adhesions, but also of post-operative dilatation and should therefore be avoided. Gauze packs should always be moist and never left in the abdomen longer than absolutely necessary, as they irritate the bowels and therefore may be the cause of adhesions. This fact is shown by the use of gauze drains for building up a well of adhesion in pus cases.—MAX EMMETT, *Iowa Medical Journal.*

A DISCUSSION OF THE OPERATIVE TREATMENT OF FRACTURES BASED ON THE OPERATION OF EIGHTY PATIENTS.

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ST. LOUIS, MO.

In spite of the number of cases treated by different surgeons, it must be confessed that the treatment of fractures has to a certain extent been unsatisfactory and productive of dissatisfaction and even malpractice suits. We occasionally see people shockingly crippled as a result of fractures received some time ago, and not properly treated under the older methods of surgery. We would probably be astonished to see the results of some *X*-ray examinations of old patients in whom we thought we had obtained satisfactory results. We are only thankful that the percentage of cures under these old methods was sufficiently large to hold the faith of the patients, and to encourage further development of the treatment of such injuries.

There has been such rapid progress in the development of the surgical treatment of the soft tissues that now modern surgery takes no chances with injured soft parts. The principle of asepsis has made possible the repair of almost every organ, and nearly all the tissues of the body. The lungs, the heart and the bloodvessels have been repaired with excellent results, as also the hollow abdominal viscera, the nerves and other tissue.

We know, of course, that there is only a chemical difference between these soft tissues or structures and the bones. We know also that the bones present less resistance to infection than do some other tissues; therefore, in handling them greater skill and care must be exercised in maintaining perfect asepsis. Under such conditions a slightly larger field of operating-room experimentation would seem more justified now than heretofore, especially when the surgeon of to-day is expected to accord the same measure of anatomical certainty to broken bones as is taken for granted in connection with other tissues. It is a need; it is expected of us as a profession, and we are not doing our duty unless we meet it.

There are two general considerations governing operations on fractures, that of the systemic risk and that of the local risk. Consequently general health must be considered very carefully in all operations for fracture to be certain that the patient is a good operative risk. As to the local risk incurred, there are three very important considerations:

It is positively necessary in the first place that the surgeon who desires to make a success in the operative treatment of fractures be a skilled mechanic. He must understand mechanical principles and be able to apply them.

Secondly, he must have the proper mechanical equipment, instruments not found in the ordinary hospital outfit. In the early operations which I performed considerable mechanical difficulty was experienced in getting into line and in keeping in place two parts of a broken long bone while securing them together. In order to meet this difficulty it was necessary to devise a traction instrument—as traction secured through manual efforts proved both inefficient and uncertain—and also a powerful clamp. This was found to be necessary for the special purpose of lining up the fractured long bone and then holding it in position when properly apposed.

A picture of the traction instrument which I devised was printed in the *Journal of the American Medical Association,* October 21, 1911. It consists of a long screw and a triangular frame almost two feet in length, which is bolted to the foot of the operating table in a horizontal position, if the fracture be one involving a bone of the leg. By turning the screw any amount of tractive force can be secured by a cord attached to the end of the screw and the patient's foot. For a fracture near the ankle, two towels are looped around the foot, and the cord attached to each. But if the fracture be high enough a very convenient way of getting traction is to fasten a screw eye to the heel of an ordinary high shoe, and attach the cord to this. This traction instrument is a contrivance which any blacksmith can make, and is to be recommended for the armamentarium of hospitals where dependence is now placed on manual tractive efforts.

The powerful clamp mentioned above consists of three separate parts: the male blade, which is made to support the fracture from beneath; the female blade, or upper half of the instrument, which determines the proper direction and acts as the opposing blade of the clamp, and a butterfly nut, by means of which the desired pressure is secured and maintained. The special advantages of the clamp are many—the case with which each part may be placed in position or removed; the clear view of the fracture line at all times; the certainty with which fragments of any shape and size are driven to a common axial center and held until permanently secured. This instrument makes the handling of all fracture cases where the bone ends tend to push out through the wound much simpler.

The special instruments which Lane has devised for use in fracture cases are well known. They are a long-handled bone-holding instrument, elevators, drills and screwdrivers. These instruments not only give great leverage, but by their length make it unnecessary for a hand to come in contact with the tissues.

This leads me to a discussion of the third important consideration as to the local risk in the treatment of fractures, namely, the asepsis—an asepsis which must be more rigid than any which has been used heretofore in general surgical work. No one has a right to attempt operations for fracture who is not prepared to prevent any exposure of the skin; to keep his hands from ever coming in contact with the tissues or with those portions of the instruments which do come in contact with the tissues; nor are needles, sutures or ligatures to be handled with other than sterile instruments at any time. Rubber gloves cannot be trusted to come in contact with tissues, blades of instruments, needles or threads, because of the possible contact with other things or of a minute hole in the glove.

While a large number of proposals for the open treatment of fractures have been advanced, I find myself able to treat every case presented by one of the three following methods: (1) The "Lane Plate" method, (2) the "metal nail" method, (3) "wiring the patella."

For the patella a circular loop of silver wire is used. This is placed everywhere at the periphery of the patella, in a horizontal plane with it, in such a manner that when the wire is tied all the fragments are brought together and the ruptured ligamentous structures, in which the patella lies, are thus supported, with the addition of catgut suture.

For fractures of the surgical neck of the humerus the "metal nail" method is used. In such cases this method is preferred by me to all other methods of treatment. A steel or other nail is driven down through the head of the bone into the shaft.

Elsewhere in the long pipe bones and in the clavicle I have discarded all other methods and now use only the Lane plate method in the operative treatment of fractures.

My experience leads me to consider an open operation justifiable in only four conditions of fractures:

(1) It should be used when one is unable to get the fragments in place by ordinary methods, or is unable to keep them held in the proper position.

(2) Operations for fracture are especially useful in old cases of non-union.

(3) It is, of course, desirable in all fresh widely open fractures, and possibly

(4) In chronically infected cases in which the bones lie bare. All compound wounds, whether suppurating or not, are to be packed and allowed to granulate. Generally speaking, the patient must always be a good surgical risk.

The writer is fortunate enough to have operated upon a sufficiently large number of fracture cases to make his experiences and the results obtained of interest. Following are the results of eighty cases and a short résumé of the experiences gained from them.

There were six different methods used in operating upon these eighty cases. The *nail method* was used four times in nailing the head of the humerus to the shaft. All of these wounds healed by first intention, and a perfect bony union was secured in every case.

In seven instances I used the *double pointed bone pin.* This was a method which I devised myself, but never published until now. Two of these operations were on the tibia: one a compound fracture, the result of which was excellent; the other was intended to fix the femur to the tibia after a knee joint resection. It was infected, to begin with, and later amputated. This method was used twice on the femur, with one failure, and three times on the humerus with a failure which might have been expected because breakage was due to sarcoma, as discovered later. Of the seven cases, a perfect result was obtained in four.

A circular wire was used around the patella in six operations, all of which resulted in perfect bony union, with primary healings.

In four operations—one on the tibia, one on the olecranon, and two on the femur—*wiring* was used. The result was a perfect bony union in each case. One of these, however, who was an old man and an alcoholic, died of heart failure several weeks after the operation, having recovered from a pneumonia which attacked him one week after being out of bed following the operation. The Lane plate method, however, is preferable to this.

There was one case of fracture of the humerus in which it was necessary to use a silver *saddle instrument.* This is a direct support devised by the writer for the purpose of holding the bone in position when the soft tissues are so badly lacerated that there is no possibility of applying a permanent cast about the parts. This was described in the *Annals of Surgery,* February, 1906. A perfect result was obtained in this most difficult case. Such necessities rarely arise, however.

Of the eighty operations performed, there were fifty-eight in which the Lane plate was used. It was impossible to trace twenty-six from the time they left the hospital, and one is too recent to be of value. Thus we have for final study thirty-one end results. A solid bony union was obtained in twenty-seven of these cases; non-unions resulted twice, both of which cases were fractures of the humerus, and two patients died.

As to the condition of the wound of the fifty-eight Lane plate cases, forty-seven wounds healed by first intention; six were infected, two were left open to granulate, and in three instances the history makes no mention of this feature. Only three of the above infections were in clean cases. The local risk, therefore, has been very slight.

Eleven plates were removed, five of them being in simple fractures. Of these one had compressed the musculo-spiral nerve; one occasioned a refracture, and one was infected at the time of the operation; but as to indications for the removal of the other two, I am not certain, for I did not take them out.

Of the fifty-eight Lane plate cases there were nine compound fractures. Two of these were suppurating when operated upon; three became infected and suppurated after the operation; three healed by first intention; one packed wound granulated up, covering the plate. Bony union was known to have occurred in five, *i. e.,* 55 per cent. An amputation was done in one instance seven weeks after a "Sick" plate had been introduced into a suppurating wound; the result is unknown in three instances. The plate is known to have been removed in six of the compound cases.

The following gives an idea of the number of Lane plate operations performed on the different bones of the body. On the femur there were twelve; on the humerus, thirteen; on the clavicle, four; on the fibula, three; on the tibia, nine; on fractures involving both tibia and fibula, nine; on the olecranon, three; on the ulna, three; on the radius, one; on those involving both the radius and ulna, one. The greater number of failures occured in operations on the tibia and the humerus. This is, of course, small, as there was 87 per cent. of perfect bony unions among the 3 cases of Lane plate operations where the final results could be traced, and 81 per cent. of all the lane plate operations performed were known to have healed by first intention.

I shall give a short description of a few cases typical of certain classes which present themselves in the operative treatment of fractures.

The following case is interesting from the fact that it illustrates the successful surgical treatment of a greatly impaired musculo-spiral nerve.

CASE I.—A young man was admitted to the hospital suffering with a fracture of practically all the ribs on the left side, of both bones of the forearm about the middle, of the left humerus about the musculo-spiral groove, and of the right femur, with the dislocation of the knee joint.

Coaptation splints were applied to the humerus and the arm was immobilized on an internal angular splint. One week later, tests by neurologist showed that the musculo-spiral nerve did not respond to faradic current; very slight lateral movement of fingers present. Roentgen-ray at that time showed a transverse fracture of the left humerus, fracture of the radius and ulna at lower one-sixth and a second fracture of ulna at upper two-thirds of bone. Later, massage and passive movement were performed without bringing about improvement, and operation was recommended.

One and a half months after admission, under general ether anesthesia, Dr. Willis Young made an oblique incision corresponding to the bend in the elbow. The musculo-spiral groove was found and traced up to the musculo-spiral groove on the back of the left humerus. It was found dark in color and at one point it presented microscopic evidence of a degeneration with appearance of putrefaction; it failed to react to electrical stimulants, while the triceps muscle responded. The excessive callus around the musculo-spiral groove was removed with a chisel, and a portion of the fascia sewed beneath the musculo-spiral nerve so that the nerve did not come directly in contact with the bone at the point where the callus had been chiseled away.

Through the courtesy of Dr. Young the case was then turned over to me. I applied a four-screw Lane plate, after removing callus and making groove for the plate. Approximation was perfect. Soft parts above the plate were brought together with catgut, skin closed with Michel's clips.

Six months later the patient was seen. Examination showed a complete regeneration of the musculo-spiral nerve, all fractures firmly united, function perfect, there being only a slight impairment in supination of the forearm. In all, this was a very bad case with a beautiful result.

The following case illustrates the advantage of using the Lane plate method in old and infected cases.

CASE II.—A young negro man had been shot through the leg, sustaining a fracture of the tibia. The bone was wired at once by the home physician. Five weeks later he was brought to me. There was an open wound of the leg, full of pus; no tendency to callus; over-riding of about one inch.

By means of the traction instrument and the lining up clamp the bones were secured and held in the proper position; a four-screw Lane plate was applied; through and through drainage; plaster cast. Two months after the operation the plate was removed from the open wound. There was a slight superficial necrosis under the plate. The bony union was solid, and the superficial wound was granulating nicely.

The next case illustrates the use of the open operation in the prevention of lasting deformity.

CASE III.—A girl, eight years of age, sustained a compound fracture of the right ulna in the lower third. The bone was protruding through the wound, and was reduced at once.

After we had waited six days we saw that there was no infection, that the wound was healing nicely, and that a skiagraph revealed considerable overlapping. The case seemed an ideal one for plating.

Under ether anesthesia, an incision 3 inches long was made along the inner border of the right ulna through the skin and superficial fascia, and the fracture well exposed bluntly, thus avoiding an injury to the ulnar nerve. The fragments were well exposed, brought into apposition and held securely with the Lane forceps while a small-sized four-screw Lane plate was applied. The patient was discharged in a week, the wound having healed by first intention.

Seven months later the child called to see me. The scar was in good condition; result ideal, there being no pain. The union of the ulna was perfect. The last skiagraph shows perfect alignment.

The interesting part in the following case is that nerve, muscle and tendon sutures were employed at the same time with a plating operation. It would have been fatuous to have attempted to hold the ulna alone in any position at that time, since the ulnar nerve, the ulnar artery and some tendons were severed. An ideal result was obtained by this method, more than could reasonably have been expected by any method.

CASE IV.—The man was a carpenter, 54 years of age. He gave a history of having his arm caught in a saw, and as a result presented a compound fracture of the ulna at the junction of the upper with the lower three-fourths of the bone. The common origin of the flexor tendons had been partly severed and just above the wrist there was an injury of the bone on the ulnar side, the ulnar artery having been severed along with the ulnar nerve and several tendons of the flexor sublimis digitorum. The hand was very dirty. The patient was at once taken to the operating room, where, under ether anesthesia, the wounds of the wrist were explored. The ends of the ulnar nerve were found and approximated. The ulnar artery was ligated. The proximal and distal ends of the tendons were then sutured together. A four-screw Lane plate was then inserted on the ulna, through the original wound. The cut muscles were loosely approximated, the upper wound being closed in such a way as to take careful regard for spontaneous drainage. The arm was put at right angles and we awaited developments. There was practically no infection around the wrist wound. Some superficial sloughing was present in the upper wound, but the plate remained intact.

He was discharged in three weeks to the outpatient department. Two months afterward there was a small discharging sinus of the left forearm over the region of the plate. The margins were freshened and cauterized. Three months after this he called to see me. Examination revealed the following: slight contractures of ring, middle and little fingers, anesthesia to pin pricks of the entire little finger, wrist function perfect. The wounds had entirely healed.

The following case is of interest for three reasons: (1) It shows the importance of the use of the open treatment in cases where the bones cannot be gotten in the proper position or kept in that position by the closed method; (2) it illustrates again the prevention of deformity by proper approximation; and (3) in compound fractures, or fractures of both bones, the open treatment may be used with the closed treatment, as in this case.

Case V.—A teamster, 32 years of age, entered the hospital with a history of having had his leg crushed by a crate falling upon it. Beer daily and to excess; whiskey also. Urine showed albumin and casts.

Skiagraph revealed a transverse fracture of the tibia, with about one and a fourth inches overlapping. An attempt had been made to place it in position; this had met with failure. Plating operation was recommended and patient readily consented.

Two days later an incision six inches long was made on the anterior surface of the right leg, down to the bone. Periosteum was stripped back and the bone well exposed, showing a marked protruding upward and forward and overriding of the upper fragment for a considerable distance, probably one and a fourth inches, with the soft tissues interposed between the fragments. A six-screw Lane plate was then applied, three screws in the upper and three in the lower fragment. It was believed that the overriding of the fibula would be reduced by the perfect apposition of the tibia. Leg placed on a Cabot splint, and one week later cast was applied.

Two weeks after the operation he was discharged from the hospital. Six months later the patient called. The result was found to be ideal—no shortening, no deformity. There was no evidence of inflammation or irritation produced by the plate, no swelling in the morning, slight swelling in the evening. The alignment of the tibia was good. Pain practically absent. *X*-ray later showed perfect alignment.

The next case is another illustration of the necessity of the open operation in cases where there is a fracture of both tibia and fibula, and also a double fracture of one bone.

Case VI.—This man, aged 29 years, laborer, came to the hospital with a fracture of the tibia and fibula, the tibia being fractured obliquely and in very poor position. There was a portion of the fibula, about one and a fourth inches long, broken out, in this way giving three fragments.

Under ether anesthesia, one week later, a longitudinal incision was made over the anterior surface, four inches above the ankle. It was found that the upper fragment was displaced backward and inward, the lower fragment forward and outward. After the fragments had been approximated, the triangular chip which had been displaced was put back into place and a heavy four-screw Lane plate was applied to the tibia. An incision was then made over the lower end of the fibula on the outer surface, three and a half inches long, and the bone exposed. The bone, which had been fractured in such a way that three fragments presented, was plated with a four-screw Lane plate after the fragments had been adjusted. The wound was closed with continuous catgut suture, the skin with a subcuticular suture. A Cabot splint was applied, followed by cast.

The patient was allowed to return home in one month, healing having taken place by first intention. Six months later the patient was seen pitching a sixty-pound tub of butter on a truck with ease. No pain; faint swelling after 5 p. m., after having worked all day. Alignment perfect; beautiful result; *X*-ray confirmatory.

Case VII.—Another case, similar to the last, is that of a laborer 25 years of age. By the closed method, three unsuccessful attempts under anesthesia had been made for the reduction of an oblique fracture of the tibia and fibula, the fibula being broken in three places. Two weeks after admittance to the hospital an open operation revealed a spiral fracture of the tibia, with overlapping of about one inch. It was only after considerable difficulty, much traction, the removal of granulations, the snipping off of the end of the bone, and the removal of several spiculae that the reduction could be accomplished. A four-screw Lane plate was then applied. The wound was covered and attention directed to the broken fibula. Overriding was about the same as in the tibia. There was this difference, however: The third fragment was attached only at the bottom with periosteum, and with some difficulty a four-screw Lane plate was applied so as to include the upper and lower fragments, the third being held in position by a silkworm-gut suture thrown around the bone and the plate. The wounds were then closed with a subcuticular stitch of No. 2 chromic catgut, the wound over the tibia being reinforced with several interrupted silkworm-gut sutures so as to remove some of the tension; alcohol dressing applied, and the leg placed on Cabot splint.

Skiagraph taken at a later date shows the position to be very good. A Cabot splint was applied so that the wound could be thoroughly inspected and in order to permit subsidence of any edema or swelling.

Five days after operation the cast was applied. The patient was discharged in ten days in an improved condition. Two weeks later, on examination, there was no pain, but occasional slight swelling around the ankle after walking. The alignment of the bone was very good. The patient was most

enthusiastic about the cure. According to his statement, six months after the injury he was carrying trunks weighing two hundred pounds.

This result was all that could be hoped for. There was no evidence of any irritation by the plate and the leg had certainly been put to test by the patient. Radiograph showed fine alignment; ideal result.

The next case illustrates the very excellent results obtained by the open operation in fractures of the olecranon. Such cases can scarcely be treated at all accurately by the closed method.

CASE VIII.—The patient, a carpenter, 29 years of age, had sustained a complete transverse fracture of the olecranon, with two small fragments of bone probably detached. A temporary splint with elevation was applied for four days.

A longitudinal incision over the olecranon was made by my associate, Dr. McKay. Upon opening the joint it was found filled with blood and serum. This was mopped out by sponges on forceps. With arm in extension, two small fragments of bone were removed. The olecranon was readily brought back into position and fixed with a Lane plate. It was put up in plaster in slight flexion, and elevated for the first few days. In two weeks passive motion was begun and continued daily with gentle massage. At the end of five weeks the patient left the hospital with the function of the elbow practically perfect. The patient could readily comb his hair and use this arm just as well as the uninjured arm. Pronation and supination were normal, so far as could be told. The fact that this man must earn his living as a carpenter made the result very gratifying to him.

The importance of the after-care in an open operation for fracture is only slightly less important than the operation itself. A case after operation should be just as carefully splinted as one not operated upon. That this is necessary, however, does not prevent convalescence being often greatly shortened when operative treatment has been employed.

The post-operative treatment after application of the Lane plate to the long pipe bones of the lower extremity is as follows: The extremity is placed in a plaster cast and goes about on crutches at the expiration of one week, the sound member wearing a shoe, the sole of which is sufficiently thick so that the injured member cannot touch the ground.

After placing a circular loop around the patella, one week of rest in bed is allowed; then a second week of massage of the quadriceps extensor; to this is added in the third week passive motion of the knee joint; in the fourth week active motion; during the fifth week the patient may be allowed to walk with a cane. Surely nothing of this kind is attempted when any other method, open or closed, is employed.

CONCLUSIONS.

Of the 80 cases treated, it has been possible to secure the results in 53 instances. In summing up these results we find that bony union is known to have occurred 46 times out of the 53; that non-union resulted five times; three patients died. (One of these died of heart failure; the bony union had already resulted.)

As a result of the experience gained in the 80 cases summed up in this paper, I have the most unqualified enthusiasm for the open treatment of fractures in properly selected cases. Too great emphasis, however, cannot be laid on the importance of the proper selection of cases, as shown throughout this discussion. The statistics which have been given here show exactly what has been accomplished. I am certain that the results of the next 80 cases will be much better, as experience plays a wonderful rôle in this class of work.

The number of plates in which secondary removal was necessitated forces me to the conclusion that smaller and lighter plates must be used if a tissue tolerance to them is to be cultivated. However, removal of a plate is a matter of comparative slight significance when restoration of anatomical and functional perfection are considered. I have not had to remove wires, nails or pins where aseptic healing had been effected.

Nothing short of absolutely perfect approximation justifies an open operation for fracture. By this is meant a union so exact that no fracture line can be seen by spectators a few feet away from the field.

An ideal result is possible even when Lane's plates are used in the presence of pus, as shown by one case.

The mortality here shown of three in eighty can be still further reduced by more discrimination in the material chosen. I lost one alcoholic from pneumonia eight days after plating a clavicle, and a second in delirium tremens 15 days after the same treatment of a femur; the conclusion is obvious. My third death occurred suddenly as the patient was about to be discharged, apparently cured.

My experience shows me that for practical purposes one must regard the bone plate as highly useful in fixing fragments only until external splints have been applied. I have seen screws become loose where motion inside of the cast was possible, something especially true of the femur or humerus. There can be no doubt then that a better prognosis can be given for a thin than for a fleshy person so treated.

NEPHROPEXY.

THE NECESSITY OF TECHNIC.

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The question of floating, movable or loose kidney will not down. It is brought up continually, from various standpoints. Some say the condition is quite common and produces no symptoms. Others are radical and claim that by removing the condition, no matter what means are employed, the patients are cured of all kinds of trouble, from simple dyspepsia to insanity. On the surgical side of the question some claim that it cannot be permanently fixed, hence there is no use doing anything for it, but that general and constitutional treatment, with proper support, will keep the patient fairly comfortable.

Now, there must be something wrong somewhere, or these diverse opinions would not exist. All the different opinions have foundations of facts, but it is the judging from one or two cases that causes nearly all the trouble.

The fact of the matter is that in some cases a very loose kidney does not cause any trouble, but such cases are rare. There are other cases that are comparatively only slightly movable who have a great deal of trouble and distress. In other words, cases vary extremely.

The surgical aspect is virtually the same. Many operations are performed, with a poor technic and the result is recurrence of the trouble. The general practitioner, and even a good number of surgeons, therefore, decry operative procedures, and the poor patient is allowed to suffer.

Men who treat diseases of the stomach, and have a good many cases of general ptosis of the abdominal organs, claim that surgical fixation of the kidney is of no avail, but treatment by belts and supporters will give relief so you see we are all still at sea in the management of this not uncommon trouble.

It seems to me that the great principle involved is overlooked. These cases and the mode of treatment have some great underlying principle that is lost sight of; they flounder around and arrive at wrong conclusions. The principle that I refer to is that *the kidney is not an abdominal organ;* that must be borne in mind; *it is outside of the abdominal cavity.* The abdominal organs may be loose and floating while the kidneys are in their proper places, or the abdominal organs may be in their proper places while the kidneys are loose, or they may all be loose at the same time. If we constantly bear this in mind, then we can analyze and understand each case better.

Many cases of loose kidney are due to a fall or a strain, especially in young women. Sometimes it seems due to severe labor. The kidney is the only loose organ, all others seem to be in place. In the early stages of the condition, comparatively few symptoms are produced; they gradually increase in severity, disturbances of digestion, flatulency, atony of the colon, etc., and as the kidney becomes looser, twisting occurs, nephritic colic develops. Such cases are promptly and permanently relieved by fixation, as I have frequently proven.

The other class of cases, where there is a general relaxed condition of the abdominal organs, and also of the kidney, have similar symptoms, aggravated if anything. Placing such a patient on the back, the loose kidney is easily found, but the condition of the abdominal viscera is overlooked; fixation of the kidney is made and the patient not cured.

This, to me, is simply due to *poor diagnosis.* If the kidneys were fixed properly, and the surgeon *turned the case over to the gastro-enterologist* for some treatment (as development of the abdominal muscles, properly fitting belt and constitutional treatment), that patient would be cured. *Nor is that patient cured by the stomach specialist alone,* because the belts and constitutional treatment alone will not keep the kidney in place.

The only treatment of that kind, that might give relief, is to put the patients on the back and stuff them with fat producing foods until they are quite fleshy, then the amount of fat around the kidneys sometimes keep them fairly fixed.

In cases of general abdominal ptosis, *the kidneys should be fixed first* and then the other treatment instituted to cure the patient. *Now, I have challenged anybody to hold the kidney in place with the hand while they are vomiting or sneezing or coughing.* This cannot be done, and certainly the hand is the best abdominal supporter. As the patient strains, the kidney is bound to slip from under the hand. Hence, if the hand cannot keep it in place, certainly no instrument devised could do so. A belt will not keep them in place, but it will keep the *abdominal viscera somewhat fixed* and prevent them from moving around to a great extent, and thus lessen the symptoms of dragging; but the kidney being back of the peritoneum still moves and wabbles around.

Once in a while the kidneys will dip forward and become adherent to the peritoneum and shove into

the abdominal cavity. They are covered by the peritoneum and then appear to be abdominal organs, but in my experience this is not often the case, and does not invalidate my argument. The displacement of the *pelvic organs* and the symptoms produced by them are entirely independent of the other, although they often accompany the general ptosic condition, and need not be further considered in connection with this question.

SYMPTOMS.

Most patients complain of a pain in the back or the side where the kidney is loose, generally on the

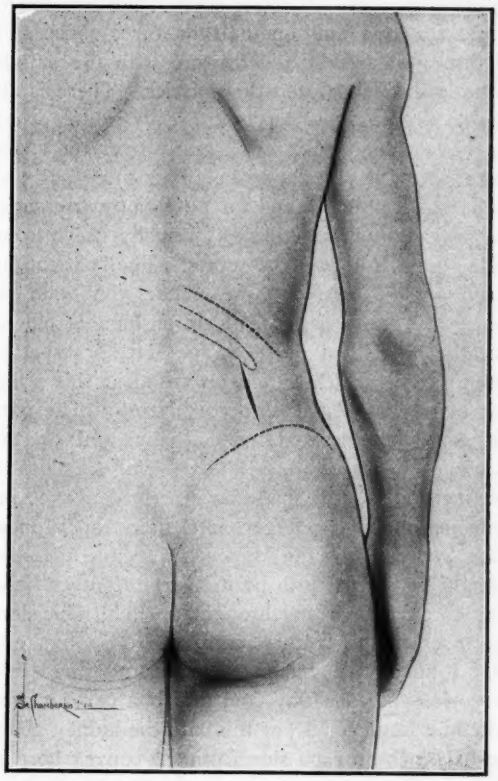

Fig. 1.

right side, and, of course, if both kidneys are loose, on both sides. Sometimes they have themselves discovered a lump, as they call it.

If you put the patient on the back, the kidney often returns to its own position, but by making that patient strain or cough it comes down and can be felt. I generally make this examination first, and then have the patients stand up and bend the body forward, making them strain and cough as indicated and then can feel it.

Sometimes, if the liver is quite loose, it is often very difficult to detect the kidney, but with a little care the two conditions can be found. In all such cases an examination of the urine must be made. Often small amounts of albumin are found which disappear after the operation. These are the direct physical symptoms. The other symptoms are so numerous and diverse that they can hardly be mentioned in a paper like this.

I have already mentioned that disturbances of digestion are common, especially flatulency, and in this connection might mention trouble in the cecum and symptoms produced in the appendix. I, like others, have often found such conditions, but I could never see how the *loose kidney would produce trouble in the appendix,* except in rare cases.

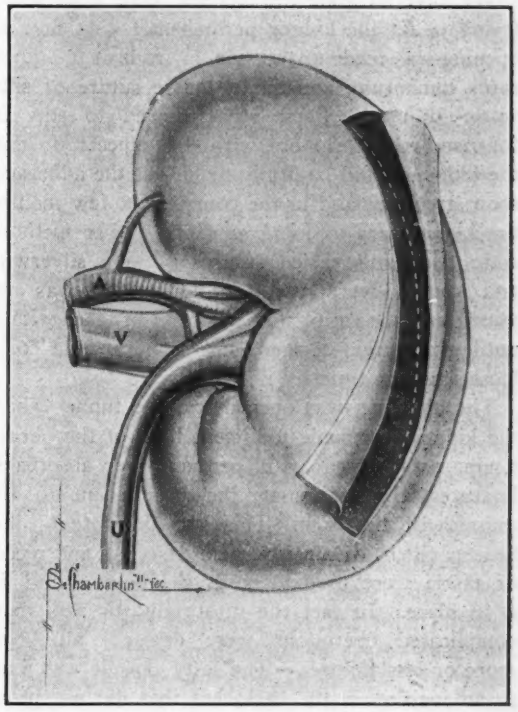

Fig. 2.

It sometimes comes down that far, and if it does it does not press on the appendix, and it always seemed to me that it was a coincidence, and the same constitutional discrasia which produces one produces the other.

The nervous symptoms are the principal, besides those mentioned, and these are so diverse and numerous that simply by being on the lookout you will find them. A great many are of a hysterical nature and some are found in neurasthenia. Then we have actual pains, and reflex headaches and even insanities of various kinds, and here comes in the fine diagnostician.

Sometimes the nervous symptoms are independent

of the kidney trouble and due to entirely different causes. The *superficial diagnostician* overlooks that and attributes everything to loose kidneys and fails to cure his patients, which results in a black eye for surgery. The greatest care must be taken in making a diagnosis if independent other trouble exists; the prognosis should be guarded, as only part of the symptoms can be removed by fixation of the kidney. It has seemed to me and I have always claimed that the nervous symptoms were caused by pulling and irritation of the solar plexus of nerves.

OPERATION.

We have all gone through the same experience, trying to fix the kidney permanently. At first an opening was made at the side, in front of the quadratus lumborum, and an en masse suture of silkworm-gut used. These were allowed to stay in for two weeks or more with the expectation that the kidney would be firmly fixed, but the adhesions soon stretched, and in the course of a few months the kidney was as loose as ever. Other methods were tried and varied sutures of silk, silverwire and catgut were used. The kidney was retained in place with gauze and held in place with it until granulation formed, and still it would come loose again in time.

The abdomen was opened and the tunnel which the kidney had made for itself, back of the peritoneum, was closed with permanent or absorbable ligatures, by fastening the peritoneum to the muscles of the back. This was of more or less benefit. Strips of muscles were desected, and pieces of fascia were used to cover the kidney, and fix it in place. In fact the most fantastic and most complicated operations were devised, all being more or less failures. The fatty capsule was fixed to an incision in the back, but that did not prove useful. The fascia below the kidney, called a ligament, was used by Longyear with some benefit.

I did not try all these methods, but I did try some, and was soon impressed that they were no good, as a rule. I came to the conclusion that only the fixation by the fibrous capsules could be permanent. First making only a short incision, I soon found that the kidney would not be injured if we denuded it extensively of its fibrous covering, so I finally made an incision at the convex border from one pole to the other, stripped the capsule off on one side and then made an incision or tear towards the pelvis of the kidney, then made an incision or tear on the other end near the pole. In fact, the incision would form the letter "z." With a little care we can cut through the capsule only and not injure the kidney; but if we do it, it does not harm it, only bleeds a little.

The next thing that I had to settle for myself was how to reach the kidney. At first, I started at the outer edge of the quadratus lumborum, but I found it difficult to get the kidney up high enough under the rib, as the corset or the waist band would sometimes squeeze the lower end of the kidney. I then made the incision in the middle of the above muscle, but in looking the anatomy over carefully I finally made the incision in the back, at the junction of the *erector spina* and *quadratus lumborum* muscles, from the lower edge of the ribs downwards, for two and one-half or three inches. I cut through the skin and fat and with the handle of the knife I separated the muscles. There is almost no bleeding, few nerves are really injured, they are shoved aside. We cut directly over the space where the kidney ought to be (Fig. 1).

The usual preparations for operations are made. The patient is anesthetized. I usually use nitrous oxide gas, followed by ether. The patient is placed on the side opposite where you want to operate. A sand bag or an air cushion is placed beneath the patient at the waist line, or what is better a table which can be elevated at this point such as we use in gall-stone operations. The part that is to be operated upon is thus put on the stretch. The knees are well flexed on the abdomen. The incision is now made as described above; introducing one or two fingers into the retroperitoneal space, you can feel the kidney. If it is very loose it might be shoved into position by the other hand from the abdomen and brought up to the incision. The trouble is to hold it there, as I do not take it out. I have tried various devices and found that there was only one way, and that is a two pronged vulsellum forceps. I put this into the kidney about one-half inch on each side from the convex border. With my finger *I now strip off the fatty capsule, or adherent peritoneum (if any), and thus prevent any dragging on the kidney in the future by any abdominal organ* (Fig. 2).

I now make an incision in the kidney as described above. I sew the upper part of the triangle to the erector spina muscle. The other flap I sew to the quadratus lumborum at the lower angle of the wound. The kidney is now fixed where it belongs, that is, at least, as near as I can get it (Fig. 3).

I sew it with so-called No. 3 catgut, plain, not chemicalized in any way. With a running suture I then bring the muscles together. We thus get the reflected fibrous capsule of the kidney between two muscles and have it firmly fixed.

The skin and fat I do not sew. I take a sponge and dip it in alcohol and wipe the surrounding skin, gradually freeing it from all fat; then with sterile adhesive plaster, one-half inch wide and about one inch long, I bring the skin together accurately. Then I take a long strip of two-inch wide adhesive plaster, start it on the left side just above the umbilicus and draw it tight towards the right and the back, covering the plaster of the in-

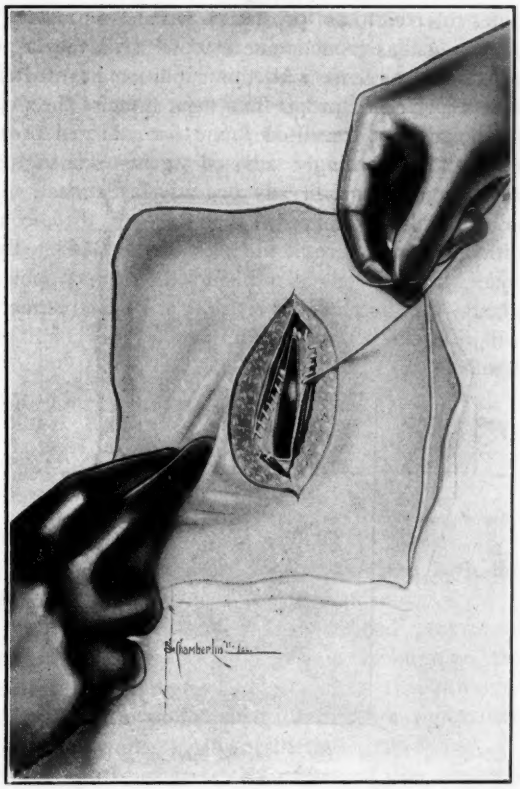

Fig. 3.

cision and going as far as the spinous processes. This means for operation on right kidney.

I think this plaster acts as all kinds of bumpers during coughing and straining. This is all the dressing that I apply. I keep the patient in bed about two weeks and take off the plaster, including that which unites the skin and put on another long strip which I allow to remain until it comes off, generally in three or four weeks.

If a so-called stitch abscess should form, I treat it in the usual manner.

To sum up, I would say:

1. The kidney is not an abdominal organ.

2. The movable kidney produces in many cases great distress and the most diverse symptoms.

3. A movable kidney may exist without any other condition.

4. Frequently a movable kidney co-exists with general abdominal ptosis and requires separate treatment.

5. Movable kidney is often found with many other abnormal conditions of the system.

6. The symptoms produced by the movable kidney can only be relieved by proper fixation.

7. The proper fixation of a kidney will not relieve other independent abnormal conditions.

8. The most careful differential diagnosis must be made in all cases.

TREATMENT OF PROSTATIC OBSTRUCTION.

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Successful treatment of prostatic obstruction means for the patient relief from the obstruction and its accompanying symptoms. The degree of success attending the treatment depends upon three principal factors. First, the time in the course of trouble that the patient comes for treatment; second, a clear knowledge and understanding of the conditions by the surgeon, and third, the care of the patient before, during and after the operation.

We wish to call attention to and emphasize the importance of having every patient above 45 years of age with urinary trouble come early for examination and treatment. It has been customary for men at this time of life to accept their condition as a matter of course, an incident to advancing years, believing that it could not be cured, therefore must be endured. Prostatic patients are often allowed to go on for months and years under temporizing treatment, until the opportune time for proper treatment has passed. It is the experience of every genito-urinary surgeon that patients come in or are sent in for treatment when either the prostate has become malignant or the kidneys greatly damaged from back pressure or infection, making operative treatment of little value, or positively contraindicated. Such patients go on for a few months of miserable existence and die, while if proper treatment had been instituted at the proper time many years of comfortable life would have been possible for them.

It is unwise, besides it is unfair to the patient

to advise against operative treatment when it becomes necessary for him to resort to the frequent use of the catheter for relief. Such patients if allowed to continue in this way in many instances produce infection of the bladder, and finally a condition of general urosepsis. When serious complications have developed, and the patient is no longer a safe surgical risk, both the patient and his physician are often anxious to have something done to remove the cause of the trouble. It is gratifying to observe that not only many of the general profession, but some of the laity, are beginning to realize the importance of early recognition of these troubles; as a result, many patients come earlier for treatment than they formerly did. However, there is still room for improvement in this direction.

Hypertrophy of the prostate is not synonymous with prostatic obstruction. Conditions of the prostate other than hypertrophy may and do cause obstruction to the outflow of urine. Recent careful study of these cases has brought about a more accurate understanding, and we no longer make a "snapshot" diagnosis of an enlarged prostate, simply because a man is 45 or 50 years of age and is troubled with urinary obstruction. Each case is studied and examined to determine the exact cause of the trouble and the character of the prostate. In a large majority of cases it is hypertrophied. This can be determined by digital examination per rectum, by the catheter in the bladder and by the use of the cystoscope. There are some cases of enlarged prostate which are not easily recognized by digital examination, as the enlargement may be from that portion of the gland in direct apposition to the bladder, and may have protruded into the bladder near the internal meatus, causing obstruction.

Very often this is suspected by examination with the catheter. Many cases can be viewed by the use of the cystoscope. The cystoscope is not universally applicable to all cases, but it should be used wherever it can be without causing the patient too much distress. Prostatic obstruction is often accompanied by vesical calculus. Routine examination of all prostatic patients with the *x*-ray often proves the wisdom of its use. If calculi are present they can be detected, their size and number determined, which is an important thing to know before operating, so that a complete operation can be done. It would be a matter of some chagrin and embarrassment to the surgeon to carefully remove a prostate and leave one or more calculi in the bladder. The degree of inconvenience and distress suffered by the patient is not in direct proportion to the size of the gland. A very large gland may cause very little trouble, while a very small gland may cause complete and continuous retention. It is the small fibrous gland that has given the surgeon a great deal of trouble in former years, because it was not understood how and why there could be obstruction without a large prostate.

"Contracture at the neck of the bladder," sometimes referred to as "prostatism without a prostate," causes just as troublesome symptoms as the large gland, and patients with this condition have often been deprived of proper treatment because the first physician they consulted found no enlarged prostate, and accordingly advised against consulting a surgeon or against any operative treatment. It is now generally conceded that there are three conditions—contracture at the neck of the bladder, the small, hard fibrous gland, and the hypertrophied gland—that may cause obstruction. The treatment will, of course, vary according to the condition found.

Fig. 1. Actual Size.
Prostatic collar removed intact. Was causing complete retention. Patient, J. C.; age, 64.

In case of simple contracture at the neck of the bladder, it is, of course, useless to attempt to do prostatectomy, because in these cases there is very little prostatic tissue present. Such a case needs simply a removal of the bar, which is best done through a median perineal incision, splitting the posterior urethra, thus making the bar accessible. A section of this bar can be removed either with scissors or with a prostatic punch. It is preferable to operate on this condition through the perineal incision rather than through the urethra, for the reason that if there should be excessive hemorrhage it can be easily controlled and drainage is better.

In the case of the small, hard, fibrous prostate, there is great difficulty in removing the gland, be-

cause of the numerous fibrous adhesions to adjacent tissues. This class of cases requires the best surgical judgment and skill to produce satisfactory results. The cause of obstruction may remain ever after the glandular structure has been removed, which should be determined before leaving the field of operation. This can be done by introducing the index finger into the bladder. If there still remains a firm fibrous band it should be treated in the same way as suggested for contracture at the neck of the bladder.

Removal of the large adenomatous gland is usually not very difficult and results are satisfactory. The most important thing to be remembered in the treatment of any of these three conditions is that the *obstruction* must be removed, otherwise the patient will continue with the distressing symptoms he had before the operation, and both the operator and the operation be condemned.

Fig. 2. Actual Size.
Same as Fig. 1 opened out. Post-operative results entirely satisfactory.

In cases of malignancy which had progressed until a radical operation is out of the question, the patient can be made comfortable by the introduction of continuous drainage through a suprapubic cystotomy under local anesthesia.

Having determined the nature of the obstruction and having decided that operative treatment is indicated, the next important step is to determine whether or not the patient is a fit surgical risk. It is not all of surgery to make a diagnosis of a surgical lesion and proceed to operate. There are three distinct periods of every surgical case that require special care and attention—the preoperative period, the operation and the post-operative period.

The *preoperative period* is the time prior to the operation when the patient should be studied most carefully and prepared for the operation. This period may be a few days, a few weeks, or it may be the only period, if the patient cannot be sufficiently improved to make the operation comparatively safe. During this time the patient is examined most thoroughly as to his heart, lungs, etc., with particular attention to the renal activity.

It has been noticed that when continuous bladder drainage had been instituted, the specific gravity of the urine in some cases was reduced from 1025 to 1008 or 1010. When this occurs or when the specific gravity was low prior to the drainage, operation should not be attempted until this has gone up to 1020 or more. There is an exception to this and that is when there is a decided polyuria in which there is a good output of urea, etc. On the other hand we may have a patient with a high specific gravity and high percentage of urea, but still be a bad surgical risk because of diminished amount of urine. A careful urinalysis should precede every operation.

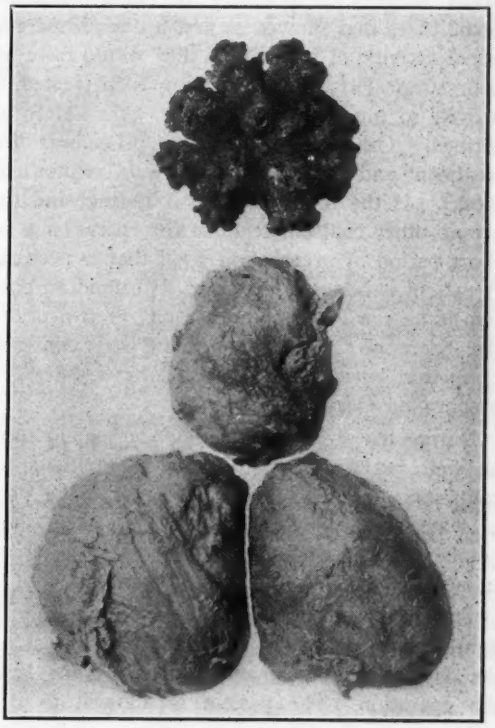

Fig. 3. Actual Size.
Oxalate of calcium stone complicating a three-lobed enlargement of the prostate. Patient, H. S.; age, 68. Perfect recovery.

It is best to make a further study of the functional activity of the kidneys before operation. This is based upon the observations that normal kidneys remove from the circulation certain drugs that have been introduced, within a certain time and that marked deviations from this time indicate abnormal kidneys.

The most reliable and valuable of these tests is the phenol-sulphone-phthalein test developed by Rowntree and Gerahty. In brief this consists in introducing into the upper arm 1 cc. containing

.006 of the drug. This should show in the urine in from 15 to 20 minutes. During the first hour 40 to 50 per cent. of the drug is excreted as is determined by a colorimeter and 20 to 25 per cent. during the second hour. Variations from these figures indicate damaged kidneys. It can be administered intravenously, in which case it appears in the urine in from 2 to 5 minutes and a greater percentage (75 to 80) is excreted during the first hour.

This test has proved to be very reliable and has saved surgery a mortality on many occasions. Some cases that showed at first a diminished functional activity, at which time they would have been poor surgical risks; after having been treated, improved so much that operations were safely performed. Others showed no improvement from treatment and died the "natural way" within a few weeks. If the renal function is normal and there are no other contraindications for operation a very short period of preparation is all that is necessary. A patient is better prepared to withstand an operation if he can be put to rest a day or two prior to the operation. Of course, there are emergency cases that must be deprived of the benefit of the preparation treatment.

During the preparatory period the patient should be well fed with easily digested, nutritious food containing few proteids. He should have plenty of water, and, above all things, his system should not be depleted of water by copious purging with salines immediately before the operation.

The intestinal tract should be thoroughly but gently emptied by the administration of castor oil the day before and an enema a few hours before the operation. The patient is allowed to drink water up to the time of operation. The kidneys cannot secret urine when the system has been deprived of its water. In surgery of the urinary tract, particularly prostatic surgery, a great deal can be done to improve the condition of some patients by continuous bladder drainage through the catheter retained in the urethra for a few days prior to operation, or in very bad cases suprapubic cystotomy performed under local anesthesia. In this way back pressure is removed from the kidneys and they will functionate much better, thus improving the patient's condition and increasing his resistance to shock, sepsis and post-operative anuria.

Having arranged for the operation the patient should be prepared and anesthetized with as little confusion as is possible. This is an anxious time for most patients and their mental state should be as composed as possible. If the patient is particularly nervous he should not be required to walk into the operating room, mount the table and there take the anesthetic. This should be administered in a nearby room where all is quiet. Ether is the anesthetic to be generally preferred, but in bad risks, such as old people and those known to have a bad heart or bad kidneys where operation is imperative, nitrous oxide-oxygen is the anesthetic of choice. There is less toxicity carried into the circulation from this than from any other anesthetic and less cardiac and respiratory depression, hence less liability to kidney disturbance. The patient is not

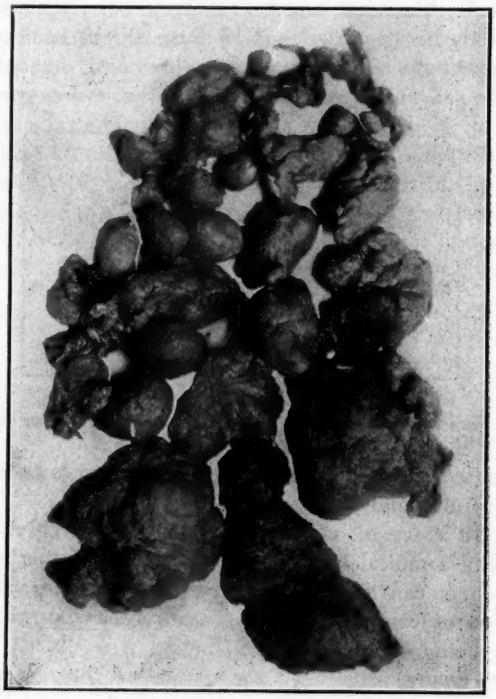

Fig. 4. Actual Size.

Numerous, small, glandular nodules from a fibro-adenomatous prostate. Patient, G. M.; age, 78. Specimen removed through perineo-urethral incision. Normal urinary function six days after operation.

left saturated with the anesthetic and is seldom troubled with nausea and vomiting afterwards.

The operation should be done as rapidly as is consistent with good work, for the longer the operation the greater the shock, and the greater the shock the greater the circulatory disturbance, in consequence of which the blood supply to the kidney is diminished, a very apparent cause of renal inactivity. The surgeon should not waste any time lecturing or demonstrating the operation to bystanders, the same as if he had a cadaver before him. His whole duty is to the patient who is under an anesthetic, and, besides, surgeons are not made

by watching surgery at a distance for ten days or two weeks. In short, everything should be done to lessen the shock and amount of anesthetic and to conserve the patient's reserve force, so greatly needed for recuperation after an operation.

The surgeon's duties to the patient do not end with the introduction of the last suture. A great deal can be done in the next few hours to assist the patient in regaining his general physical equilibrium. Immediately following the anesthetic the patient should be given oxygen inhalations. In old people and bad risks this should be continued for several hours. This same class of cases should receive at least two pints of saline solution under the skin, and when returned to their beds proctoclysis of saline solution (about forty drops to the minute) should be started and continued for several

Fig. 5. Actual Size.
Complete gland removed intact through small median perineal incision. Patient, W. B.; age, 68. Complete recovery.

hours and repeated at intervals for several days if there are any evidences of renal failure. As soon as the patient awakens from the anesthetic he is given hot water to drink and plenty of it. The conditions existing during an operation are those that tend to produce an inactivity of the kidneys and these can best be overcome by increasing the blood pressure by increasing amount of fluid in the vessels which brings more blood to the kidneys. The toxicity and acidity of the blood have been reduced by dilution and salt.

The former custom of withholding all fluids from the patients for twenty-four hours after operation and until drastic catharsis has been established, was all wrong, and has no doubt worked greater disaster than we know.

Hiccough and persistent vomiting following operations is indicative of diminished renal activity and should be looked upon as a symptom or a note of warning rather than an independent complication calling for special treatment.

The points to be emphasized are: First, the importance of prostatic patients receiving proper treatment early; second, that proper treatment cannot be applied unless the surgeon knows the character of the lesion and the condition of his patient, and, third, the value of a careful preparation of the patient for the operation together with proper after-treatment. When all of these factors are given due consideration the most satisfactory results are obtained and the mortality reduced to a minimum.

THE TREATMENT OF ABSCESSES AND OF THE NECROTIC FOCI RESULTING FROM THE INJECTIONS OF SALVARSAN.

A. RAVOGLI, M.D.,
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There is no longer any question as to the therapeutic value of Ehrlich's arsenobenzol, known under the name of salvarsan. Its beneficial and curative action in the active syphilitic affections is absolutely remarkable. It kills the spirochetae in every period of the disease, beginning from the initial lesion to the last gummatous manifestations. Of course, every remedy has some cases where the success is not complete. In 20 per cent. luetic manifestations reappear, spirochetae are found again in the serum of the lesions, but as Tschernogubow[1] remarked by repeating the injections the spirochetae disappear along with the symptoms. The recurrence of syphilitic manifestations after the administration of salvarsan has been very ingeniously explained by Pollitzer.[2] He suggests that while the spirochetae, which are actively pathogenic, are killed by the remedy, many others which have assumed, or may assume, a resting stage are not affected by the remedy. From that resting condition they may subsequently emerge with renewed power for harm. This gives the explanation for the return of the spmptoms and how it is that only one injection in many cases is not capable of accomplishing the *sterilisatio magna* as it was formerly intended by Ehrlich.

It is the purpose of this article to deal with the local untoward effects of salvarsan. This drug, when injected into the tissues, in solution, in suspension, or in emulsion, produces always necrotic action on the tissues. This necrosis is not limited to the connective tissues of the subcutaneous layer, but affects as well the derma, the fasciae and the

muscles with which it comes in contact. The same necrotic influence is found when salvarsan is injected acid, neutral or alkaline, in any degree of concentration, or in a diluted solution, or mixed with oil. It seems that acid salvarsan is much more dangerous than a neutral or an alkaline solution, and the necrotic influence is much more accentuated. Some necrotic effects occur also in the blood vessels, causing thrombosis of the veins after the intravenous injections, with resulting phlebitis.

There is no doubt that this drug shows different degrees of toxicity if administered acid or alkaline, and at the same time the susceptibility of the patient has much to do with the occurrence of the lamented untoward effects. The acid solutions, however, are considered much more dangerous, and, according to MacKee,[3] all the injurious and also unfortunate effects have been attributed to it. Cases of death as reported by Von Notthafft,[4] Fraenkel and Grouven[5] and others, seem to have been the result of the injection of salvarsan in acid solution. In fact, Hering[6] proved on small animals the high toxicity of the salvarsan in acid solution, and Miessmer[7] on cattle found that an acid solution of the drug, although given in very small dose, killed cattle with symptoms on the respiratory organs. The autopsy showed thrombosis of the blood vessels and inflammatory exudate in the parenchyma of the lungs. This was explained by Michaelis[8] by the possibility that the drug in acid solution may be precipitated in the circulation by the alkalinity of the blood. Miessmer and Schottmüller[9] by adding a few drops of an acid solution of salvarsan in a test tube with blood serum found that precipitation took place which, if occurring in the animal system, may be the direct cause of the fatal results in animals and in man.

The disorganizing action of salvarsan on the tissues can be easily demonstrated, as Tryb[10] did by taking fresh pieces of muscles or liver in a test tube and pouring in a diluted solution of salvarsan. After a few minutes the solution near the pieces of animal tissues appear milky and turbid. This shows its oxydizing and reducing property. This same reducing power can be demonstrated also on different salts. Solutions of sublimate or silver nitrate, on the slightest addition of salvarsan, soon precipitate. In the tissues by the addition of osmic acid the presence of small particles of the drug can be demonstrated.

When a solution of salvarsan at a different degree of concentration is injected under the skin or into the muscles of a small animal, local changes soon occur. The tissues touched by salvarsan fall into necrosis, which is more deep and complete according to the time the drug has remained in contact with them. The muscles remaining in contact with salvarsan are liable to undergo a waxy degeneration. Surrounding the place of injection a large quantity of leucocytes accumulate, which have lost their power to take the stain and soon decay. Outside of all an area of reaction is present consisting in proliferating connective tissue corpuscles, plasma cells and also some giant cells. The tissue cells are badly altered and only with difficulty are they recognized. In their midst small amorphous granules of salvarsan are found in quantity. In this area of reaction leucocytes are seldom found, and it seems they do not take the salvarsan. According to Tryb it seems that no phagocytosis takes place with salvarsan, at least in the area of necrosis.

Some alterations which have been found experimentally in animals are found in man, in every place and in every tissue wherever the solution has been injected. Lovejoy[11] examined a mass of indurated tissue removed from a patient three months after the injection. He found a deposit of granular substance in the loculi of the tissues, where the fluid had made its way forced by the pressure. It seems that those loculi must have been filled with the amorphous granules of the drug. The tissues surrounding the injection show marked signs of degeneration. The connective tissues are greatly damaged. The fibrous tissues have somewhat increased. The blood vessels were found to be filled with granules, especially the smaller vessels and the lymphatics, which have been found completely blocked. The walls of the blood vessels were found somewhat reduced in thickness, and in a state of degeneration like the other tissues.

A piece of necrotic mass was removed from an abscess of one of my patients. The abscess occurred four months after the injection. I tender my thanks to Dr. Charles Goosmann, who kindly prepared the specimen for microscopical examination, and took the two microphotographs, which illustrate the article.

Fig. 1. ¾ object. Shows a mass of dead tissue in a hyaline degeneration; some straps of connective tissues are still recognizable in the degenerated mass. A small quantity of leucocytes is seen on the left which are mixed with the tissues.

Fig. 2. 1/6 object. Shows a granular mass which are granules of salvarsan covering a muscle. The muscular fibers are degenerated. No nuclei can be seen and they show to be in the condition of waxy degeneration. This shows the severe action

which is displayed by the remedy on the living tissues.

How was the injection given?

It is of great importance to state in what way the drug has been prepared for injection. I am still using the neutral or mildly alkaline solution as prepared by Alt. The salvarsan 0.600 is placed in a sterilized glass mortar, and is mixed with 5 cc. of hot distilled water. By rubbing for a few minutes with the pestal salvarsan dissolves completely in form of a clear yellowish fluid. This fluid is very acid. To this I add 13 drops of 15 per cent. solution sodium hydrate, continuing to rub with the pestal. It is converted into a yellow homogeneous emulsion reminding one of the mayonnaise sauce. In the beginning I added some more hot distilled water to fill the tube of the centrifuge. After five minutes in the centrifuge the yellow thick emulsion is at the bottom and clear water at the top. The water is drained, and the thick emulsion is mixed with normal salt solution to make 20 cc. Testing this mixture, it is found sometimes acid. Then three to five drops of the solution of sodium hydrate is added until the solution is slightly alkaline. After some time the centrifuge was done away with, and by adding normal salt solution to the extent of 20 cc. was so injected. It seems to me that the patients complained of more pain, and signs of reaction were more marked when the salt was used. The observations referred to by Schreiber and later by Tryb, that the presence of the salt solution in the neutral mixture of salvarsan produces precipitate of the drug, and therefore increases the pain and the local irritation, made me abandon the normal salt solution. Then I began to use the preparation dissolved in distilled water slightly alkaline. This change was of no satisfaction; nearly every patient so injected complained of more severe pains, lasting longer than with the former method, and several suffered from abscesses. Indeed, the alkaline solution of salvarsan is much more injurious to the tissues with which it comes in contact, and when very slightly alkaline, nearly neutral, it is much better. Taught by such an experience, I have returned to the use of the centrifuge, removing the first water of the solution, and to the addition of the normal salt solution making a neutral, or very slightly alkaline solution.

When the injection is given intravenously, then the preparation must be alkaline in order to obtain a clear solution. The same process has to be followed, only the normal salt solution is added to 250 cc. in the graduated jar and shaken. The fluid is a yellow turbid solution and the sodium hydrate is added drop by drop, shaking until the solution is clear like beer. To clarify the solution it took 27 drops of the sodium hydrate; recently it has taken 32 and 35. At times I have filtered the solution with paper filter, but I believe that the paper must have had some influence on the solution because it has turned somewhat greenish, and has caused plugging of the vein. I am now using sterilized cotton for filter.

Clinical Symptoms.—In general I give the injection of salvarsan in the lumbar region on both sides, three or four inches from the spinal column. The lumbar region as maintained by Corbus[12] offers a good place for the injection, and it is not so exposed to irritations as the subscapular region. In the gluteal region deep in the muscular masses I have given the injection only a few times. The pain arising was so severe that the patient could not lie in bed except on his chest, and so I decided the best place to be the lumbar region. The patient disrobed entirely is placed on an operating table or in his bed. The back is scrubbed with green soap and water, then bathed with alcohol. I do not find any reason for painting it with tincture of iodine. The syringe (Hata-Ehrlich record) full of 10 cc. of the solution is ready. With the left hand I raise a fold of the skin and muscular masses, and I introduce the needle obliquely downwards to its full length; when no resistance is found, slowly and gently the fluid is pushed into the tissues. The same operation is repeated on the other side. The parts are gently massaged with a piece of sterilized gauze for a few minutes until no

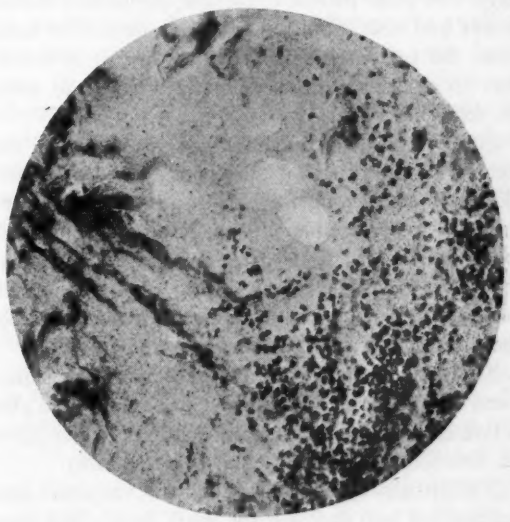

Fig 1.

signs of fluid is perceptible. The little wounds of the needle are covered with a pad of sterile gauze and kept in place with straps of adhesive plaster.

No patient has so far complained of pain during the injection, nor immediately after the injection, so much so, that many can travel for a few hours without much discomfort. After six or eight hours the patient complains of burning sensation in the place of the injection, accompanied by general symptoms of nausea, pain in the stomach, at times vomiting. In some cases the pulse becomes very slow, in others very frequent. In most of the cases the temperature rises to 99° F., in some to 101°. In a few cases it has reached 103° after an intravenous injection, with a general erythematous eruption.

The pain in the locality of the injection in many cases is not severe and lasts from three to five days. In other patients, however, the pain is rather severe and lasts from ten to twelve days. In some cases the patient becomes restless and it is necessary to resort to the use of opiates so as to quiet his sufferings.

Local Changes.—Inflammatory symptoms on the locality of the injection take place, but are usually slow. For three or four days no swelling or induration is perceptible. There is only a tenderness to the touch. In some cases a rose red erythematous area is seen where the fluid went in the subcutaneous tissue. The tissues are edematous from the injected fluid and salvarsan granules.

That the arsenic is quickly absorbed the symptoms of general poisoning are witness and the action on the syphilitic manifestations, which after 24 hours have already begun to fade away.

The tissues with which salvarsan has come into contact fall into necrosis, the more deeply and completely the longer the time the drug has acted. In most of the cases this local condition shows up after two or three weeks from the injection. The place is swollen infiltrated, or limited to a hard lump of the size of a small apple. There is no soft feeling, nor signs of breaking down. In cases where the fluid has been sent into the subcutaneous tissues the resulting swelling gives an undulating feeling like that due to the presence of a fluid, which could be mistaken for a true abscess. If it is opened there is no pus, nothing comes out; the loculi of the subcutaneous tissue are imbibed with yellow fluid and the tissues appear white and disorganized. If with a curet we press on these tissues, or with the point of the scissors we cut into the edematous tissues, yellowish serum oozes out. Under the microscope it shows detritus of decayed tissue, yellow amorphous granules representing salvarsan, leucocytes are scanty, and do not take the stain. If the place is left alone the soft feeling gradually disappears, the mass becomes hard, diminishes in size, and after three or four months nothing is left.

In other cases the place of injection after three or four months increases in size, although not painful, yet it is tender to the touch, causes itching sensation and inconveniences the patient. The tumor at this point has sometimes reached the size of a fist, is somewhat soft in the center and gives the sensation of fluctuation.

At this point it becomes necessary to open the abscess. After having prepared the part for operation, the patient rests on his chest. No general anesthetic is required because very little pain accompanies the operation; a good freezing with ethyl chloride is sufficient to diminish the sensibility. With a bistoury I make an incision from the upper to the lower segment of the tumor parallel to the line of the body and deep enough to reach the focus of necrosis. Usually no pus is found; blood mixed with dark yellowish fluid comes out of the cavity, which has no odor whatever. In one case with my finger I removed from the depth of the focus a small stonelike concretion made from the accumulated salvarsan. When the cavity is widely opened, with the curet all the necrotic masses have to be removed. The necrotic muscles, however, do not yield to the curet and often it is necessary to remove the pieces with the scissors. When the cavity has been well cleaned and washed with mild solution of bicarbonate of sodium, then I place a small piece of sterile gauze in the middle of the cavity for drainage. I sew the incision, leaving the drainage out from the inferior end of the incision, which is left open. The use of a drainage is a necessity, for the reason that it is nearly an impossibility to remove all of the necrotic particles, and leaving a drain is much better than to close the wound entirely, which containing some necrotic particles may reopen.

If the abscess is not widely opened and the necrotic parts are not removed there remains a sinus which cannot be brought to recovery unless it is opened and the necrotic masses removed. In some cases, especially in children, the skin is also involved in necrosis, and forms a large round yellow-brown dry escar, which covers the necrotic mass.

The fluid which oozes through the drainage is a yellowish serum and there is no sign of pus. Only in one case where the injection was given by a general practitioner hypodermatically in the shoulder have I found pus. The patient was admitted

to the hospital under my service. He had a large abscess, and in this case a pint of pus was removed.

The pus of this case and the fluid taken from the aseptic abscesses were sent to the laboratory to ascertain the presence of arsenic, but no arsenic could be found. As a consequence the arsenic would be quickly absorbed and the granules remaining in the tissues would be the other part of the chemicals composing salvarsan.

The same injurious action on the tissues is found when salvarsan is given intravenously. The solu-

Fig. 2.

tion must be strongly alkaline in order to obtain a perfect solution which is 300 cc. If some of the fluid leaks out of the vein between the fascia and the subcutaneous tissue it will produce a diffused redness and swelling of the whole arm resembling erysipelas. It is accompanied with pain, or a numb feeling; in some cases the patient must remain in bed. The inflammatory symptoms after a few days begin to subside, causing no more disturbance than a stiff arm. In three cases I had phlebitis, in one of the cephalic vein, and in two of the basilic vein.

The abscesses resulting in two cases surrounding the lower extremity of the biceps, and in the case of the cephalic an abscess formed on the internal region of the arm. On account of the necrosis induced in the tissues, the sloughing process goes on very slowly, and it takes a long time to obtain the cicatrization. In these cases it is better to leave the wound open, and at every dressing remove the necrotic shreds than to remove the necrotic parts at once, when we do not know how deeply the tissues are affected. A permanent injury of the arm would be a sad consequence. In all my cases the arm has returned perfectly well.

How often do we see the abscesses following the injection of salvarsan?

In my experience in 32 intravenous injections abscesses occurred in three cases, which required surgical treatment. In two other cases the infiltration resolved, and there was no necessity of surgical interference.

Among 180 intramuscular injections I saw nine cases of abscesses, which is less than six per cent. In the most of the cases the swelling disappears, a hard lump of the size of an English nut remains, and after some months this, too, entirely disappears. In the place of the injection, although the swelling has been reabsorbed, there remains a little hardness in the tissues, which does not produce any discomfort. In the beginning, shortly after the injection, in order to diminish the pain, the applications of hot compresses are very useful, and later on the massaging of the hard places helps the absorption.

A few abscesses will never shake our confidence in the beneficial results of salvarsan, neither will they deter us from giving to our syphilitic patients the benefit of this wonderful drug.

[1] Tschernogubow. Weitere Beobachtungen ueber die Anwendung des Salvarsan bei Syphilis. Monatshefte f. Pract. Dermatologie. Bd. 53 No. 2. July 15, 1911, p. 68.
[2] Pollitzer. Salvarsan—*New York Medical Journal*, Feb. 4, 1911.
[3] MacKee, George M. A comparison of the results obtained by the intravenous administration of acid and alkaline solution of Salvarsan.—*New York Medical Journal*, Oct. 21, 1911, p. 825.
[4] Notthaft von. Zur Frage der Gefahr endovenosen Einspritzungen saurer Lösungen von Salvarsan. Deutsch. med. Woch., Feb. 2, 1911.
[5] Fraenkel und Grouven. Münch. Med. Woch., Aug. 22, 1910.
[6] Hering, H. E. Experimentelle Erfahrungen ueber die laetale Dosis der Sauren Lösung von Ehrlich Hata 606. Münch. Med. Wochenschr. LVII, p. 2621, 1910.
[8] Michaelis. Deutsche med. Wochenschr. XXXVII, p. 2278, 1911.
[7] Miessmer. Die Ursache für die giftige Wirkung saurer Salvarsan Lösungen. Deutsch. med. Wochenschr. XXXVII, p. 491, 1911.
[9] Schottmuller. Deutsch. med. Wochenschr. XXXVII. p., 670, 1911.
[10] Tryb, Anton. Prag. Histologische Veraenderungen des Gewebes nach Einspritzungen von Salvarsan. Monatshefte f. Pract. Derm. Bd. 52, No. 8.
[11] Lovejoy, E. D. Histological changes occurring at the site of injection of 0.6 gmm. of Salvarsan. Journ. Cut. Dis., July, 1911.
[12] Corbus, B. C. Observations on 28 patients treated with the Ehrlich Hata Remedy. J. A. M. A., Feb. 25, 1911.

FLAP IN OPERATIONS ON PATELLA.

In operating for fractured patella I generally employ for the exposure of the parts, a flap having its convexity downwards. The incision commences on a level with the upper margin of the patella, about one inch to one side, from here it passes downwards to a point a little below the apex of the bone, from where it is continued across the limb, and carried to a point corresponding to that from which it started.—A. P. HEINECK, *Denver Medical Times.*

THE TREATMENT OF FOREIGN BODIES IN THE ESOPHAGUS.

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Although the esophagoscope has greatly aided us in the management of impacted foreign bodies in the esophagus, it has not, and cannot, entirely supplant the older methods.

Many physicians cannot spend the time necessary to become familiar with the instruments and therefore cannot afford to possess the necessary appliances for esophagoscopy, and, even if they could, their lack of experience would often render the method unsatisfactory; besides there are not a few cases in which the time-honored methods of operation are simpler, easier and quite as effective as esophagoscopy.

For the removal or dislodgment of common pins and small fish bones from the esophagus there is no instrument more generally useful and effective than the old bristle bougie, which can be employed with almost perfect safety. For the removal of coins and buttons from the esophagus often nothing is better than the old bent esophageal forceps, or a straight, smooth, blunt-pointed and toothless eight-inch hemostat.

As a part of this brief paper I have selected from among my case records a few merely to illustrate some of the principal features in the treatment that have been impressed upon me in this work, but I shall avoid routine histories.

L. A. N., aged 24, came to my office stating that he had swallowed a pin a few hours previously and that he felt the point a short distance below the larynx. He had swallowed nothing since the accident. No radiograph was taken. I passed a bristle bougie well down the esophagus and withdrew it and repeated the procedure two or three times, but with negative results. I then passed a large smooth olivary bougie, but could feel nothing. I then assured him that I thought he would have no further trouble, which proved to be the case. In most of these cases the foreign body has passed into the stomach before the patient reaches the specialist. Although such patients are usually obsessed with the idea that the foreign body is actually in the esophagus, I have never resorted to the ruse recommended by some of showing a pin which I claimed to have removed, but when I have failed to get the pin or fish bone, I have said that I thought the sticking sensation was due wholly to a wound. When I have shown them the working of the instrument which had been scraped two or three times up the esophagus they have been satisfied. So far as I know, I have made no mistakes in this way, although I think the pin or fish bone has not been obtained in more than 25 or 30 per cent. of all the cases.

I might cite numerous cases of small fish bones and pins lodged in the esophagus, but these are so common that case records would not be of interest. In all of these, excepting where the foreign body has been fixed in the fauces or in the larynx, or pharynx, or in the opening of the esophagus, I have found the bristle bougie more generally useful for their removal than the esophagoscope and forceps, and for one who has not had experience with the latter method the bristle bougie would, without doubt, be the best. The patient's sensations cannot be considered a reliable guide as to whether or not such foreign bodies as these have been removed; indeed, in most cases the patient will believe that he feels the pricking of the bone or pin for a day or two after it has been dislodged. Therefore, when the bristle bougie has been passed down and up the esophagus two or three times, the operator need not feel disturbed if he has not secured the offending body, or if the patient still thinks he feels it at the original site. When we consider how easily quite large bodies may be overlooked in the esophagus, we will realize how difficult it may be to see a pin or a nearly transparent fish bone.

C. M., 4 years of age, swallowed a nickel, 2 cm. in diameter, two weeks before I saw her. Since the accident she had regurgitated all solid food, but took liquids without trouble. At the time she entered the hospital the temperature was 99.2 degrees, pulse 120. Under chloroform anesthesia I passed the esophagoscope even to the cardiac orifice, but had to search nearly three-quarters of an hour before I was able to find the coin, though it was located only a short distance below the cricoid cartilage. The instrument passed by the coin repeatedly without touching or exposing it, apparently because of a fold of edematous tissue. As soon as I could see a small portion of the edge of the coin I had no difficulty in its removal. The child made an uneventful recovery.

Formerly foreign bodies that could not be extracted were often crowded into the stomach, and even now if an esophagoscopist were not at hand this procedure would be proper under some conditions, especially when the body is not very large or rough, and has passed down into the mediastinal portion of the esophagus. As an illustration, I may mention the case of a boy who swallowed a

tin whistle that had lodged in the lower part of the esophagus, who was brought to me years before esophagoscopes were attainable, and before the development of small electric lights made them especially serviceable, and long before we recognized the possibility of using a long straight inflexible forceps in the esophagus. I could not secure the foreign body by any attainable instrument and a thoracotomy would have meant almost certain death. With an esophageal bougie I crowded the whistle down a few millimeters each day for several days until it finally passed into the stomach. The boy is now a man and has never had any further trouble from the whistle. However, crowding a foreign body from the esophagus into the stomach should not be attempted at the present day if it is possible to secure the assistance of a competent esophagoscopist.

A boy, 6 years of age, had swallowed a piece of tin a few hours before he was brought to me. The parents had only the child's description of it. The radiograph showed a round piece of metal about 2 cm. in diameter located in the median line just above the level of the clavicles, with its flat surface forward. A lateral view gave a shadow just in front of the spine about 8mm. thick by 2 cm. long. This was before the days of bronchoscopy. I gave chloroform and passed the bent esophageal forceps, with which I tried to grasp the foreign body, but I failed to secure it. I tried also a metallic tube forceps with no better results. I then passed a Maw's large esophageal bougie, which went easily into the stomach, but I could not feel the foreign body. Another radiograph was then taken which showed the body lodged in the stomach. The subsequent history was not obtained.

E. S., an uneducated foreigner, who had not been long in the country, was brought to me about a month after having swallowed a sharp triangular piece of tin 2.7 mm. in length upon each side. I learned that the night after swallowing it his throat had been quite sore and that subsequently he had been unable to swallow solids, but had taken fluids without great difficulty. He complained of a sticking sensation just back of the larynx. A large esophageal bougie was stopped by the foreign body 20 cm. below the front teeth. I did not obtain a radiograph, but feeling confident of the position of the foreign body, without an anesthetic, I passed a bent esophageal forceps with the blades antero-posteriorly. These were opened widely, but gently and carefully introduced past the body and closed upon it at the first effort. The body was withdrawn without difficulty. It must have produced some injury to the mouth of the esophagus, but the patient did not report again, and therefore I concluded he had made a good recovery.

Where coins or similar shaped bodies have lodged in the esophagus, if their position can be ascertained by means of an esophageal bougie or a skiagraph, either the bent esophageal forceps or an 8 to 12-inch hemostat may often be successfully employed in their removal. In such cases the exact measurement of the distance from the teeth to the foreign body should be taken, and then with the head in the proper position the forceps should be introduced down to the immediate vicinity of the body. The blades should then be opened widely antero-posteriorly, but not too forcibly, and then pushed gently downward about an inch when they may be closed with great assurance of grasping the offending body. Success may often be attained in this way, even where there is a large amount of edema of the esophagus, and in some cases where the esophagoscope might pass by the foreign body without the operator being able to discover it.

H. W. R. L., aged 2 years and 2 months, was brought to me a week after having swallowed a penny. It had been unable to eat any solid foods since that time. It had something choking upon getting excited. The history stated that after the accident the child sometimes could not swallow solid foods at all but at other times could. The radiograph showed the coin in the esophagus with the flat surfaces antero-posteriorly opposite the second dorsal vertebrae. This was before I had seen an esophagoscope. I passed a long bent forceps down to the region of the foreign body, then opened the blades antero-posteriorly and pushed it gently down an inch and a half when it closed firmly upon the penny, which was removed without difficulty.

In a subsequent case I searched diligently for a coin with the esophagoscope, but could not find it, and then using an esophageal forceps as in the preceding case, I removed the foreign body easily.

When coins have been impacted in the esophagus for some time with much edema and swelling, the folds of the esophagus are liable to cover them entirely. It is probable that in the majority of cases where the laryngologist has not been able to find a coin or button with the esophagoscope and has concluded that it has ulcerated through the esophagus, it was simply hidden in this way.

The esophagoscope appears to have been first used by Kussmaul in 1868, next by Mikulicz in 1881, and it was brought to a fair stage of perfec-

tion by v. Hacker in 1889; but the means of illumination were not then very satisfactory and it is probably for this reason that, although several operators presented papers on esophagoscopy during the next few years, the operation did not meet with great favor until it was taken up by laryngologists subsequent to Kirstein's publication in 1895, and following Gustav Killian's epoch making work on laryngo-tracheo-bronchoscopy and esophagoscopy from 1896 to 1899. Since then the management of foreign bodies through the esophagoscope has become an established operation of very great value, which has been adopted by many laryngologists and by some internists who are specializing on diseases of the stomach. It is significant that most of this work has been done by laryngologists, although they cannot claim credit for the discovery and early development of esophagoscopy.

Before attempting to pass an esophagoscope, the laryngo-pharynx should be thoroughly examined with a laryngeal speculum. In practising esophagoscopy it is desirable first to locate the position of the body by a bougie or radiograph; then an instrument of proper length and of a size as large as can be comfortably introduced should be selected which should be fitted with an obturator which will allow it to pass into the esophagus smoothly and without injuring the soft tissues. Good assistants will generally be needed, one to hold the head firmly, another to attend to the anesthetic, if one is used, and a couple of nurses to furnish the other desired help. It is best to place the patient upon the back with his shoulders drawn from 4 to 6 inches beyond the end of the table, the head bent backward and supported firmly by the first assistant. Dr. Jackson prefers having this assistant sit at the patient's right upon a high stool with his left foot resting upon a lower stool, which will bring his left knee up to about the desired height of the patient's head. The assistant's right arm is passed under the patient's neck and his hand brought up on the left side to hold the gag, which is an essential instrument. The left hand grasps the vertex and holds the head firmly. I have been accustomed to having the assistant upon the patient's left side, the anesthetist upon the right side, and someone else to hold the gag and possibly the patient's body.

Unless it has become inflamed the esophagus is not very sensitive; therefore, if the patient has fairly good grit or if he is so small that he may be held quietly, it may be unnecessary to use any anesthetic. Where an anesthetic becomes necessary, cocaine from 10 per cent. to 20 per cent. in a 1 to 2 to 4,000 solution of suprarenaline will often be found sufficient; but cocaine is too dangerous to be employed for this operation in any considerable quantity in children.

K. H., a girl 14 years of age, swallowed a sand burr the day before she was brought to me. She felt that it had lodged in the upper part of the esophagus on the right side. It caused much pain when she attempted to swallow. I applied cocaine and passed a bronchoscope 7 mm. in diameter, with an internal light, well down the esophagus, and slowly withdrew it, searching carefully in every direction, but was unable to see the foreign body. I then took a larger instrument which would distend the esophagus, and passing it carefully found the burr 15 cm. below the upper teeth. I removed it with a Killian forceps without difficulty.

In short operations in children under four or five years of age who are not too excitable, many times no anesthetic is needed; but in children who are frightened or very nervous, or in adults who are not able to stand discomfort, and in all cases where spasm of the esophagus occurs, a general anesthetic will not only be of great help to the operator, but it will save the patient much discomfort and will render the operation less dangerous. Ether is without doubt the safest anesthetic for the purpose, though chloroform has several apparent advantages. I formerly used chloroform with children, and think every one who has employed it would recognize its advantages if it were as safe as ether; but as it is not, the operator cannot use it without assuming grave responsibility. It should not be forgotten, however, that complete anesthesia is especially dangerous when there is much dyspnea. In passing an esophagoscope under such circumstances great care should be taken not to make any unnecessary pressure on the trachea by carrying the instrument too far forward.

The esophagoscope may be introduced by the sense of touch guided by the forefinger of the left hand, or it may be introduced by sight with the aid of a laryngeal speculum (tube spatula). There are several instruments that may be employed for this purpose—Jackson's, Killian's and my own are most familiar to me, and all possess the requisite qualities. When the end of the instrument has been passed into the mouth of the esophagus, the patient's head should be brought a little farther forward so that it may follow the natural course of the organ without pressing too greatly upon the trachea.

The esophagoscope may be illuminated either by

the internal or by the external light, but it should not be forgotten that dynamo currents are dangerous because of the possibility of short circuiting; therefore, some form of battery of low voltage should be employed. A battery has been devised by Jackson which leaves little to be desired in this direction. With his battery the small internal electric bulbs or the larger Bruënning or Kirstein lamps may be highly illuminated without danger to either patient or operator.

As an illustration of the ease with which foreign bodies may sometimes be removed, I may cite the case of a five-year-old child that had swallowed a nickel, 2 cm. in diameter, four days before he was sent to me. The *X*-ray showed the foreign body lodged back of the cricoid cartilage, with its flat surfaces antero-posteriorly. Under chloroform anesthesia I introduced a bronchoscope with an internal lamp, quickly found the coin and withdrew it without difficulty with an ordinary tube forceps. The child was discharged the next day.

The principal difficulties experienced by operators in passing the esophagoscope come from incorrect position of the patient's head and the direction of the instrument, though sometimes spasm of the muscles of the pharynx or esophagus causes a serious obstacle. The correct position of the patient's body and head and the proper direction of the instrument cannot be better described than in Chevalier Jackson's excellent monograph. The essentials are that at first the head be bent backward, so as to straighten the cervical curvature and bring the axis of the oral cavity parallel with that of the esophagus; but as soon as the mouth of the esophagus has been passed the head must be brought slightly forward so that the instrument is directed downward and backward at an angle of about 10 degrees. An obturator that supplies a smooth conical end should always be used unless the instrument is passed by sight. Spasm should be relieved by deep anesthesia.

A few years ago this operation was said to be devoid of all danger, but we know that even with experienced operators fatalities may occur, and we have reason to believe that with others there may be a large percentage of mortality. In a recent publication Jackson states that in a series of 616 esophagoscopies for foreign bodies which he had collected it was shown that 19 deaths had occurred, or a mortality of 3 per cent.; but, as he very justly states, this probably indicates the mortality of skillful work in large clinics, and he feels that the deaths at the hands of unskillful operators must be many times greater than this; indeed, he had confidential correspondence from esophagoscopists giving accounts of eight other deaths. If the inexperienced operator has a successful case he reports it quickly, but if another case terminates fatally he has nothing to say. Indeed, excepting in hospital service, for obvious reasons, even among fair men, very few of the fatal cases can be reported. He regards the esophagoscope in the hands of rough, careless or inexperienced physicians as a dangerous and often fatal instrument. Yet the traumatism I have found after some unsuccessful attempts at removal of foreign bodies leads me to think that possibly any other instrument, excepting perhaps the bristle bougie, in similar hands might be quite as dangerous or even more so. It has appeared to me that there is a large element of danger in too prolonged operations, and I think that an hour ought to be the limit. I have seen only two cases that illustrate the dangers of impaction and removal of foreign bodies from the esophagus.

The first, a child aged two years, was brought to me four days after having swallowed a silver quarter 2.4 c.m. in diameter. It was a weak, rachitic child, with very large head and prominent veins, but no other bodily deformity. I found a temperature of 100° and pulse 110. The blood examination showed 23,650 leucocytes. The child had been unable to take any food since the accident and consequently was very weak. A radiograph showed that the coin was lodged in the esophagus just above the level of the clavicles, its flat surfaces antero-posteriorly, the position in which flat bodies practically always lodge in the esophagus. I was unable to operate until the following day, when, under chloroform anesthesia, I passed an esophagoscope and soon found the coin, which was removed without difficulty. The temperature steadily increased from the time of the operation for about 36 hours, when it reached 108° F. shortly before death. No autopsy could be obtained. This child had been five days without any nourishment before the foreign body was removed, and from the fever and leucocytosis it seems fair to conclude that the operation did not hasten the fatal result. I am confident that no injury was done during the operation.

I saw a somewhat similar case with Dr. Friedberg in which a child about two years of age had swallowed a coin 2.3 c.m. in diameter. It had been in the esophagus 11 days when I assisted Dr. Friedberg in its removal. Considerable injury had been done to the esophagus by efforts at its extraction before Dr. Friedberg saw the patient. The

radiograph showed it located a little above the line of the clavicles, a little to the right of the median line. We passed an esophagoscope even the whole length of the esophagus and searched critically and repeatedly for the foreign body, but were unable to see or feel it. Finally, when esophagoscopy had proven fruitless, a blunt pointed 8-inch hemostat was passed into the esophagus until it neared the position of the coin, when it was turned and the blades carefully opened antero-posteriorly. It was then pushed gently down about an inch and closed on the edge of the coin, which was removed without further difficulty. The temperature had been from 100 to 102.2° before the operation; subsequently it ran from 100 to 104° until the child's death four days after the operation. No post-mortem examination was obtained.

Notwithstanding the difficulties and dangers attending esophagoscopy for the removal of foreign bodies, the history of this operation for the last few years leaves no doubt that the aid of an experienced laryngologist should be secured in all cases where foreign bodies have become impacted in the esophagus. Where it is impossible to obtain the help of a skillful esophagoscopist the methods which I have already referred to, such as removal by bent or straight forceps without the aid of illumination, or pushing the foreign body into the stomach, are sometimes justifiable. In every instance where possible, esophagoscopy should be employed instead of the much more dangerous esophagotomy.

H. C., a child 2½ years of age, had swallowed a fleur-de-lis chatelaine pin six days previously which had very rough sides and angles and measured 2.8 c.m. in length by 2.1 c.m. in breadth. The radiograph showed it lodged in the esophagus just above the level of the clavicles, with the flattened surfaces antero-posteriorly. The child had been unable to take any solids, but swallowed liquids freely. Under chloroform with the esophagoscope, after a great deal of difficulty, I succeeded in seeing a very small part of the end of the pin, which I grasped with forceps and removed. The patient made an uneventful recovery.

T. J. E., aged 60, was brought to me three days after having swallowed a chicken bone having two ends joined at an angle of about 30 degrees. This patient had not been able to swallow even a drop of water since the accident. Three physicians had made persistent efforts to remove it, but without success. I gave the patient ether, and upon passing an esophageal tube found that a good deal of injury had been done about mouth of the esophagus which so altered the appearance of the parts that it was difficult to determine the conditions and it was impossible to see the foreign body. After a prolonged search I passed a large bronchoscope down the esophagus to the cardiac orifice of the stomach and I searched every portion with the greatest care, but was unable to see any foreign body. I then introduced a large olivary bougie 1 mm. in diameter, which passed without obstruction into the stomach and encountered nothing that gave a sensation of a foreign body. Upon withdrawing it carefully, however, I noticed a slight sensation which I attributed to the foreign body near the mouth of the esophagus. I then introduced a large tube, and passing it gently and slowly into the upper portion of the esophagus worked it down and up until I finally discovered one edge of the bone lying laterally across the esophagus between two folds of mucous membrane. I seized it with forceps, and though it was quite firmly impacted withdrew it without difficulty. The patient made a speedy recovery.

An operator must not too readily conclude that something which to him appears unnatural is the wound through which a coin or button that cannot be found has made its way through the esophageal wall, for in the great majority of cases it would be very much more likely that such a foreign body was hidden by a fold of edematous tissues.

The very great mortality from external operations and the almost hopeless chance for success from thoracotomy should encourage the esophagoscopist to adopt every reasonable measure to discover and remove anything impacted in this organ. Where large or rough bodies have become fixed in the lower portion of the esophagus, they should be broken up in some way and removed piecemeal, the greatest care always being taken not to inflict injury.

After the removal of a foreign body from the esophagus, if there is reason to believe that any necrosis has occurred, or that any injury has been done, the patient should be nourished by enemas for a few days, and then liquid diet should be given until the surgeon feels confident that the parts have sufficiently healed to allow the ingestion of solid food. For relief of inflammation and as an application to injuries I recommend the administration of a powder, every three or four hours, consisting, for an adult, of 20 grains of subnitrate of bismuth and 20 grains of calcined magnesia. This should be moistened with a few drops of water and swallowed in this pasty condition with a hope of smearing it over the whole surface. The magnesia is added to the powder for the sake of

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DRAINAGE OF ACUTE PLEURAL EMPYEMA IN CHILDREN.

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It is true that pus in the pleural cavity may be absorbed, or may become inspissated and remain there, an innocuous, cheesy or calcareous mass. It is true that removal by aspiration of the bulk of the pus collection may aid nature to dispose of the remainder. Also that sterilization of the pus may be effected by introducing formalin in glycerine; also, it is true that nature may find a way to discharge a pus collection directly through the thoracic walls, or through lung or bronchus, or, more indirectly, by burrowing into the abdomen; and yet the rule still stands, and has very few exceptions: if there is pus in the pleural cavity—drain.

Certain points may be gained by previous aspiration: namely, diagnosis may be established and a specimen secured for examination as to the presence of infection and its cause; and relief may be afforded from the tension within the chest, and the compressed lung allowed a degree of expansion—gradual expansion, more easily borne than the sudden release that takes place with a free opening of a large pleural abscess without previous aspiration. In exceptional cases where there is immense bulging of a large pleural abscess, and therefore great tension within, and corresponding extreme compression of lung, more than one aspiration, at intervals of a day or a few days, may be useful.

But usually the first aspiration is sufficient for its purpose, and then the only question is, how the chest should be opened, by simple incision between two ribs or by excision of a portion of one or more ribs. This question is quickly decided—the freer the opening the more perfect the drainage. But if the patient is very young, under one year or possibly eighteen months, or is so extremely feeble as to be able to withstand only the slightest trauma, or if the opening must be made without an anesthetic other than local, then the simple incision will be chosen. And the simple incision, through which is inserted a drainage tube, may do all that is necessary. But it has disadvantages. It affords no opportunity to explore the cavity, or to remove fibrinous masses; it is apt not to drain well, or to close before the abscess cavity is obliterated, or to press upon the tube and cause necrosis of the adjacent edges of ribs. These objections may be avoided by rib resection.

How many ribs should be resected—one or more than one? In the somewhat recent case, one in which fairly prompt expansion of lung may reasonaby be expected, to remove a portion, an inch or two inches or one rib is usually enough. But if the case is of longer standing, with much compression of lung, and the child is able to stand a little greater operative trauma, or if the infecting agent is other than the pneumococcus, portions should be excised from two ribs as the primary operation. I am not now speaking of cases that have been previously opened and drained and yet failed to obliterate the abscess cavity. The great majority of cases in young children do perfectly well with resection of a portion of a single rib, and the proper use of a drainage tube.

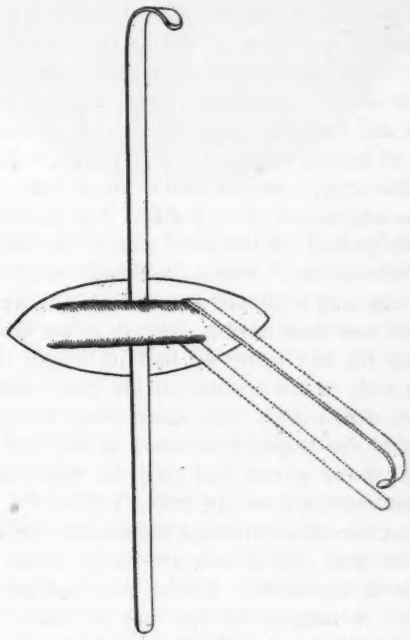

Fig. 1. Kelley's Rib-Stripper.

Where shall the opening be situated? Naturally, with a loculated or circumscribed abscess one has no choice but to make the opening as directly into it as the anatomy of the parts will permit. With a collection free in the pleural sac the sixth or seventh rib in mid axillary line requires as little damage to overlying structures and at the same time affords as good drainage as any spot that can be chosen.

The incision goes down upon the center of a rib and through the periosteum, and should be about two or two and a half inches long. Nothing is gained by attempting to work through an incision of an inch or an inch and a half, as one sometimes sees it done. It is true, the skin can be pulled from one end to the other of the incision, but what is

gained? For the opening, even when fairly large, tends to close all too soon. A cross incision at either end of the first one is usually unnecessary. The periosteum should be separated before cutting the bone. By so doing the intercostal arteries remain undisturbed, as the opening into the pleural cavity is made through the center of the space vacated by the portion of rib removed.

It is awkward to puncture the abscess prematurely in the act of removing the periosteum from the under side of the rib, and have the wound flooded with pus blown out forcibly at every breath and cough before one has completed the removal of the bone. This may be avoided and the work facilitated by the use of a small instrument which I have devised and called a "rib-stripper." It is made of a strip of flexible copper, 18 or 20 gauge in thickness, 9 inches long, a quarter inch or more wide, bevelled at the edges, and silver plated. The periosteum is readily pushed off the outer side of the rib. Then the "rib-stripper," with a little beak or elbow bent near one end, is slipped under the rib between periosteum and bone until it emerges at the other edge of the rib and is drawn half its length through. Both ends of the instrument are then brought together with a slight pull, which bends it around the rib, and the looped instrument is slid first to one angle of the wound and then the other, stripping the periosteum from the under side of the rib. It is most convenient to make the anterior cut through the rib first. Rib-shears are handy unless the incision is too short. Liston bone-forceps do the work. A rongeur-forceps may be used. I have seen in the hands of different operators a chain saw and a wire saw used. Neither is necessary. The piece of rib being removed smoothly, it remains to puncture with knife, scissors, or a pointed hemostat, the middle of the bared space to a size large enough to push in the index finger and explore the cavity.

At this exploration one notes especially the extent and direction of the cavity, the degree of lung compression, the apparent firmness of the visceral pleura, any evidences of loculated abscesses, any adhesions between visceral and parietal layers which should be divided when possible by a sweep of the finger.

A rapid evacuation of the pus is not desirable. On the contrary, it is better to allow it to escape but slowly for a time, pulse and respiration being meanwhile noted. The opening is then enlarged. Any masses of clotted pus are hooked out with the finger, or, when appearing at the opening, removed with forceps. The opening is made as large as two finger-ends, and a drainage tube is introduced.

Much ingenuity has been displayed in the devising of drain-tubes for empyema, and I have tried many. None have proved so efficient, or given so little trouble by clogging, or by slipping out, or far worse yet by slipping in, as the Flint empyema tube. It is spool-shaped, that is, the tube has a flat circular flange at each end. Placed with the smaller flange within the chest (it does not thrust against the expanding lung), the larger rests flat on the chest outside and it slips neither way, but can be pulled out without trouble when discarded. I like the "double-barrelled" tube.

A voluminous antiseptic dressing and a binder complete the procedure.

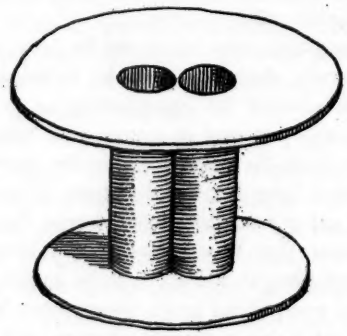

Fig. 2. Flint Empyema Tube.

But if, as sometimes will occur at the moment of opening the pleura, violent coughing ensue and the respiration and circulation become much embarrassed and are not relieved by covering the opening temporarily with a large sponge and turning the patient onto the back, then no exploration of the cavity should be indulged in at that time, but the tube quickly inserted and covered with the dressing and binder.

Washing out the cavity should not be done at the time the opening is made, and only in selected cases and with due care at any time. Washing is only necessary when gangrene is present, or if fetor persists *after the most thorough drainage*. Pumps, siphons, valves and suction apparatus are more bother than they are worth in children. They are quite uncalled for where an adequate opening properly located is maintained. Occasionally a counter-opening or a second resection at the lowest point of the abscess cavity is an advantage. The movements of breathing and the changes of position of the child, with its mobile chest walls, will be found to accomplish all the pumping necessary. Expansion

of the lung is secured by the same means, the dressing over the mouth of the drain doubtless exerting somewhat of a valvelike action. Expansion is also aided by laughing, crying, gymnastics, blowing upon wind instruments or toys.

Cases of long standing, or those in which obliteration of the abscess cavity is not attained by these means, require extensive resection of ribs and more or less decortication of lung. They belong to a different class from those here under consideration. But there would be very few of them if the acute cases were promptly and properly drained.

2255 EAST 55TH STREET.

ARTHRITIS DEFORMANS.

(Preliminary Paper.)

LEONARD W. ELY, M.D.,
DENVER, COLO.

Like most diseases which we do not understand, chronic joint diseases fail to inspire any great degree of general interest. To our ignorance is added another reason for our neglect, namely, that a great amount of study and care must be expended upon every patient in order that the little knowledge we possess may be properly applied. It is much easier to resort to indiscriminate drugging, or to adopt the latest therapeutic panacea for all joint diseases. These patients demand relief, and if we do not give it to them they will resort to others, who, at least, pretend to believe in their therapeutic measures.

The very name that we give to this disease, or to this group of diseases, suggests our ignorance. Frankly stated, arthritis deformans means a chronic deforming inflammation of the joints whose cause we do not understand. As our knowlege of joint diseases increases, we remove more and more diseases from this wide group. Thus, gonorrheal arthritis is a special type whose cause we know. "Faulty metabolism," "nervous influence," etc., are terms we often use to cloak our ignorance, and the more tenaciously we cling to them, the slower must be our progress toward the light. It is better to confess the ignorance and to search diligently for the cause. The way to seek the cause is not by means of an *X*-ray outfit, nor by a classification of many patients, nor by a mass of clinical experience. Laboratory work is slow and to most men uninteresting, but I venture the prediction that this problem will not be solved by the professor in the lecture room, but by the microscopist.

Pathology: For a description of the joint changes in arthritis deformans I would refer the reader to

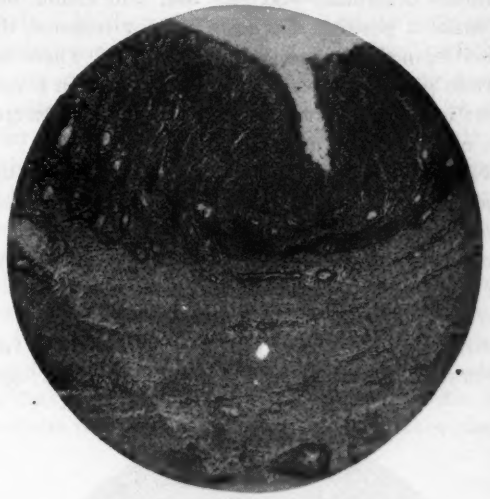

Fig. 1.

the masterly work of Nichols and Richardson.* These changes may be manifold in their nature. The synovia may present the characteristic signs of inflammation, and it may show marked villous growths. The bone trabeculae may be increased in size, normal or somewhat atrophied. The cartilage may be broken up, or it may present a decided fibrillation of its structure; sometimes its appearance is bizarre, fantastic. It is never lifted up and thrown off, as in tuberculosis. Nichols has called attention to the islands of cartilage, beneath the articular cartilage, in the substance of the bone and in the marrow spaces. Possibly these are simply prolongations of the articular cartilage downward, cut at an angle by the microtome. They are seen rather often.

As far as I have been able to ascertain, there is no one special pathological characteristic of

Fig. 2.

*Nichols and Richardson, *Journal of Medical Research*, Vol. XXI. No. 2.

arthritis deformans—nothing that will enable one to make a positive diagnosis, as, for instance, the tubercle, in the diagnosis of tuberculosis. There are certain gross changes that are found only in severe cases in the different types, but these gross changes are not constant.

Nichols divides the disease, according to the changes in the cartilage and synovia, into two great classes, atrophic and hypertrophic, but in my view the classification is deficient in that it rests only upon the *results* of morbid processes. Let us see if we can go further.

Entering into the formation of a joint are two tissues, the cartilage and the synovia. The ligament outside the synovia is usually classed as a third. There is another tissue, which, while it does not directly enter into the joint formation, nevertheless cannot be ignored in a study of joint disease, and this tissue is bone. Disease of bone (except sarcoma) in the immediate neighborhood of a joint almost invariably affects the joint itself. My studies in the pathology of chronic joint disease have led me to the view that the ligament, the cartilage, and the bone structure itself, *i.e.*, trabecula, are, as far as the disease itself goes, practically inert. Upon them are worked out the results of the morbid process, but into this morbid process they do not really enter at all. To draw a simile, they are like the framework of a house, upon which a scaffolding is erected. On this scaffolding men are at work, and if we neglect the men on the scaffolding we can only observe the results of their work and cannot understand what they are doing, except by watching the walls grow or crumble. I believe, and my belief is not yet a demonstrated truth, that for a proper understanding of all these diseases we must focus our attention upon the two *active* tissues of a joint, the synovia and the lymphoid marrow. Possibly the inner layer of the periosteum may play a part. This inner, cellular layer may be said to be continuous with the synovia, as the outer, or fibrous layer, may be regarded as a prolongation of the ligament.

The changes in the marrow may be various. Sometimes instead of the normal reticulum one sees a distinct fibrous tissue, with the marrow cells in its meshes. Sometimes the marrow cells are blurred in outline, and do not take the stain properly, sometimes no real marrow tissue can be made out. The entire marrow appears to be degenerating. In spots the marrow appears not to differ from the ordinary fatty marrow of the shafts. This last is what we should expect, and indicates that the presence of lymphoid marrow is as essential to the integrity of the joint as the presence of the joint is to the integrity of the lymphoid marrow.

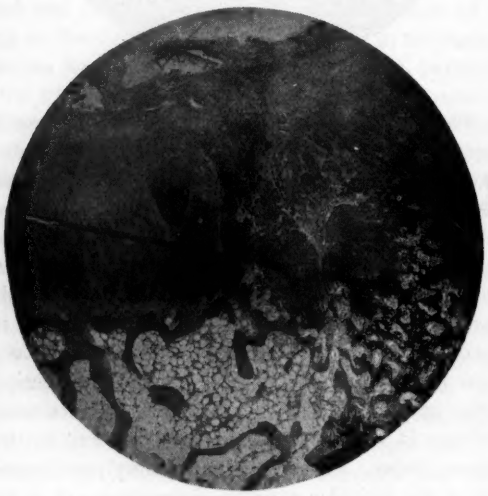

Fig. 3.

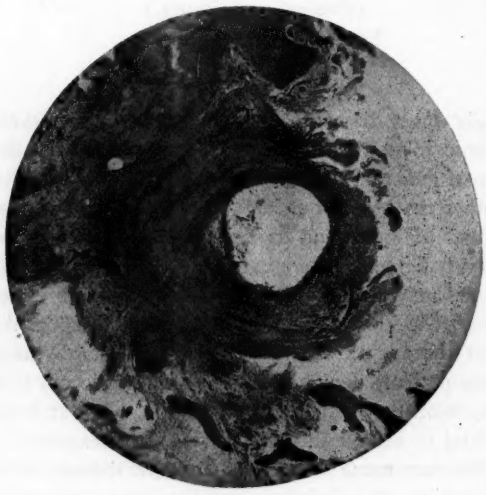

Fig. 4.

There must be dissent from this view of the exclusive role of the synovia and the lymphoid marrow, but for the present it forms a working hypothesis, and until we arrive at the ultimate cause of the disease it will hardly be proved. It is well known that after a bony ankylosis the disease ceases* Now, of course, this may be said to be from a lack of motion, but motion in itself is not the cause of arthritis deformans. It must be on account of the change in the structures of the tissues in the neighborhood of a joint, which ensue on the

*Vide Nichols and Richardson, *et al.*

ankylosis. The synovia and the lymphoid marrow (in the adult) disappear, but so do the cartilage and the ligament; hence this does not prove that the two last may not be at the bottom of the trouble. We must go further still.

Both the synovia and the red marrow are *lymphoid structures,* prone, as are other lymphoid structures in the body, to infection by various agents. The relationship of chronic joint disease to infection in other parts of the body has often been observed,* *i.e.,* to infections in the tonsil (lymphoid tissue) to chronic intestinal disease, to typhoid, to influenza, to syphilis. In almost all these diseases that have been brought into a causal relation with arthritis of any type there is an infection of lymphoid joints. If the infection of a joint be an acute, virulent one as sometimes that following scarlatina or pneumonia, we shall have a suppurating joint; if a slow and chronic one, then the changes in the joint may be those that pass now under the title of arthritis deformans. Here again we see the analogy of the disease to infections of other lymphoid tissue.

The morbid processes accompanying joint tuberculosis are now fairly well understood. In tuberculosis we know that the synovia and the lymphoid marrow are the only tissues vulnerable to a pure tuberculosis infection. If a secondary infection by pus germs be added, then the other tissues of the joint become involved, but in arthritis deformans this secondary infection never takes place,

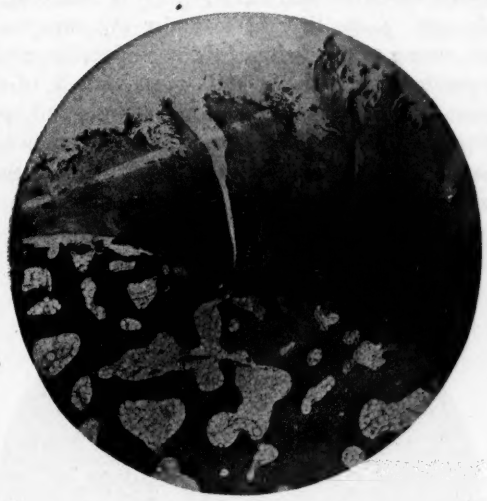

Fig. 5.

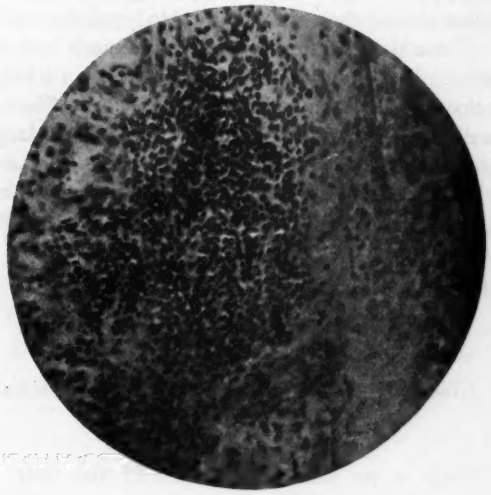

Fig. 6.

or at least of epithelial tissue. Just how this infection in the joint is brought about, and why, we are not yet prepared to state. When we do discover the relation we shall probably make a long stride toward the problem of cure.

Blindly to search for a cure until we have solved fully the problem of the cause is also unwise. I believe that sooner or later we must recognize that all cases of arthritis deformans are caused by some definite infection, not necessarily by one specific microbe, but by any one of a number of infectious agents. The gross changes brought about by these various agents may be very similar, as, for instance, the gross changes wrought by various agents in the lymph nodes may be similar. We have learned long since that the swelling and inflammation of the lymph nodes are symptoms of various diseases, and I believe that we shall find that much the same is true of the lymphoid tissues in and about the and the morbid process remains in the synovia and lymphoid marrow. In both diseases the other tissues suffer by interference with their nutrition.

In the present state of our knowledge, then, in every case of arthritis deformans, our first duty is to search for the source of the infection. This will often be revealed by a careful history. If we can find a definite cause, whether in a diseased tonsil, in the intestines, oral cavity or nose, if a syphilitic infection can be ascertained, we may be able to affect a cure, but if we administer blindly the salicylates or thymus gland to every arthritic patient we see, we shall simply be furnishing material for the quacks. The iodides have some use, but only in syphilitic cases, and then they are probably not as efficacious as mercury. To depend upon strychnine, bitter tonics and iron is to lean upon a broken reed. Cathartics may be beneficial if the infection be in the intestinal canal. Massage, baking, etc., may palliate. Passive motion is contraindicated as work-

*Vide Goldthwait, Painter, Llewellyn-Jones, Nathan, Marshall, *et al.*

ing against the rather crude efforts of nature to cure the disease by depriving the joint of motion. If diseased tonsils be present they must be removed, dental caries or a purulent otitis must be treated, faulty action of the intestines must be corrected. Goldthwait's ideas on visceroptosis are well worth serious attention. If we can locate a cause we may cure the patient, even if as yet we do not clearly understand the exact relation of cause and effect.

Finally, in the inveterate monarticular types in which the joint is so badly damaged that it can never be of much service, but where great pain and disability are present, the advisability of doing a stiffening operation must be weighed, for we may present to ourselves the axiom: "No joint, no arthritis." A perfectly stiff, painless joint is of far more service than a badly disabled, painful one.

These therapeutic measures leave much to be desired. In a very large proportion of cases their results are distinctly unsatisfactory. We shall do well to acknowledge freely their unsatisfactory nature, and to push on our researches into the nature of the disease, in order that we may have something better to take their place. At a later date we shall hope to return to this subject.

ADENOMA OF THE LIVER.

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Only 4 per cent. of tumors of the liver are primary growths; of these 4 per cent. some are sarcomata and some are carcinomata. Benign tumors of the liver, accordingly, are of sufficient rarity to be recorded when found intra vitam. Some, like the very rare lipomata, require removal when of large size; the angioma or cavernoma, sometimes found in elderly people with shrunken livers, is of a dark brown purplish color, sometimes encapsulated and formed by an enormous dilatation of capillaries following atrophic changes of liver cells. The adenoma, not so very infrequent, is of importance because of its occasional large size and because it possesses some of the characteristics of malignant growths. In some instances reported, adenomata, apparently of long standing, began to show malignant change.

Adenomata of the liver are sometimes small and circumscribed, sometimes multiple and of considerable size. They present two tolerably distinct types, in addition to the cyst-adenomata, which sometimes result from the obstruction to the gland ducts in simple adenomata. In one form, the tissue presents essentially the same structure as the liver tissue, except that the arrangement of the cells is less uniform and the cells are apt to be larger; in the other form, the cells are less like liver cells, are frequently cylindrical and arranged in the form of irregular masses of tubular structures, with more or less well-defined lumina and distinct connective tissue stroma. These latter are in some cases so closely similar to some of the carcinomata as to be distinguished with difficulty. Groups of adenomata have been interpreted as outgrowths of the bile-ducts in the periportal connective tissue. It is said that aberrant adrenal tissue has been found in the liver.

Several years ago I came accidentally across a cavernous tumor and during July of this year an adenoma of the liver came under my observation and, owing to the rarity of the condition, I consider it worthy of record. July 16, 1911, Mrs. X, of this State, was presented to me for diagnosis and operation by Dr. S., of St. Louis. The patient was a married woman, 30, rather poorly nourished.

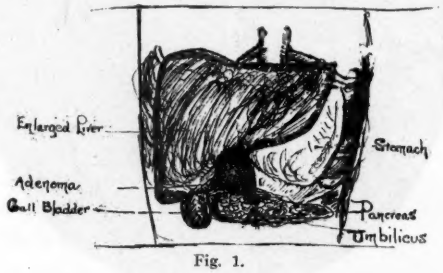

Fig. 1.

Slight pain during menstruation, otherwise menstrual history is negative. One child, no miscarriages. Capricious appetite, followed by some discomfort and eructations for several months past. Has lost 30 lbs. during the last year. Two months ago had an attack of "measles"; later, had pain and tenderness in epigastrium and also over McBurney's point. A week ago one typical attack of colic in the gall-bladder region with vomiting followed by malaise lasting several days. There was some rise of temperature (the patient believes).

At time of examination the temperature was 99.4; pulse, 88. Hemoglobin 80 per cent., leucocytes 17,000. Urine showed a trace of albumin, but no casts, otherwise negative. There was no jaundice, although the patient's color was very sallow. No blood in vomitus, no occult blood in feces and no clay colored or large, white and fatty stools. The heart and lungs were normal. The area of liver dulness was larger than normal. Marked tenderness in the epigastrium, with great resistance on

pressure. A swelling, with tenderness and a slight sense of fluctuation, was found an inch to the right of and slightly below the umbilicus, so prominent as to give the impression of close proximity to the rectus muscle or to suggest the possibility of an intramural growth. Some tenderness present over McBurney's point. Otherwise the examination was negative. Diagnosis, gallstones, with possibly an epigastric tumor and appendical disturbance.

Operation—July 19. Incision through the right rectus, beginning opposite the 9th costal cartilage and extending to a point one inch below the umbilicus. Gall-bladder large and sacculated, with enormously thickened walls. On opening the gall-bladder it was found to contain no bile, a great deal of mucus, four large and a number of small calculi. Liver and pancreas were both enlarged. The appendix was typically club-shaped, with constricted lumen, and there was enlargement of the neighboring lymphatics. Appendix removed. Exploration upwards from the gall-bladder disclosed a circumscribed tumor reaching to the anterior free margin of the liver from left edge of great lobe extending three inches to the right and as far upwards. The tumor was of fairly firm consistency, with peritoneal covering. Margins of tumor were well defined. Two gastro-enterostomy clamps, their blades covered with rubber, were applied above the upper attached margin of the tumor mass. Removal was accomplished by wedge-shaped incisions beyond the borders of the tumor, with free cauterization of the cut surface. Hemorrhage was further controlled by interrupted catgut sutures on a large round needle. The margin was covered by a strip of iodoform gauze sewed against the raw surface, with No. 1 catgut exerting pressure against the bleeding area and the drain was carried out through the abdominal incision. The gall-bladder was emptied and drained and the wound closed with drainage in the usual manner. Bile drained freely two days and the iodoform gauze came away after five days. Drainage of the gall-bladder was maintained for six weeks and then the wound was allowed to heal. Healing was complete 8 weeks from the time of operation. Recovery, with the exception of considerable tympany during first week, was smooth.

Fig. 2.

Gross pathology—Tumor, size of an apple, of firm consistency; surface vascular, but cut surface of a yellowish gray color.

Microscopic examination showed glandular tissue with fine connective tissue stroma, with glands arranged in tubular form; individual cells resemble liver cells, but are larger and less regularly arranged. Some round cell infiltration present at one point and several areas of fatty degeneration of the liver cells.

Diagnosis—adenoma hepatis.

ACUTE ANGULATION AND FLEXURE OF THE SIGMOID; A CAUSATIVE FACTOR IN EPILEPSY, WITH SPECIAL REFERENCE TO TREATMENT.

W. H. AXTELL, A.M., M.D.,
BELLINGHAM, WASH.

While acute angulation and flexure of the colon are, generally speaking, best treated by the proctologist, yet institutional care of the epileptics should include a reasonable amount of skill and proficiency in recognizing and treating these conditions. Certain it is that these unfortunates are entitled to all that will even do so much as to mitigate their miserable conditions.

While, as mentioned in former articles, all who have acute angulation and flexure of the sigmoid do not have epilepsy, yet from my observation in three or four hundred cases, not one escaped having some form of nervous derangement.

As will be noticed from the subjoined report of Dr. Wilt, Assistant Physician of Western Hospital for Insane, the treatment as carried out by him had a marked beneficial effect on all forms of nervous derangement, and in case of the epileptics, there was a lessening of the severity and a reduction of the number of convulsions. If it is borne in mind, as Dr. Wilt suggests, that the patients con-

fined in the institution are insane epileptics, and the difficulties encountered in carrying out this form of treatment, there will be less difference than supposed in his results and those reported in private practice, by the writer. He had no hearty co-operation of the patient, while in my cases treatment was eagerly sought and directions carefully observed.

What Dr. Wilt is doing and the results being obtained in the Western Hospital for the Insane can be done in any well regulated institution, and if only one case in 31, as reported, can be relieved of this scourge, the effort is well expended, not to mention the salutary effect on other forms of insanity.

The report of cases prepared by Dr. Wilt is omitted because it would unduly lengthen the paper, but his statement of facts is given in lieu thereof.

The treatment outlined applies to all cases of angulation and flexure, regardless of whether or not the condition produces epilepsy and, for all practical purposes, can be largely utilized by the general practitioner.

The only thing that will militate against an intelligent application of the treatment is the lack of a full appreciation of the condition and what really constitutes a normal healthy evacuation. I feel I am within bounds of reason in making the assertion that there is not one in one hundred of the average practitioners, and many of the more prominent ones, who fully realize what constitutes a healthy stool, or really appreciates when the colon is empty. I am also convinced that not one layman in five hundred has a definite notion of the condition of his own colon, or what constitutes a normal bowel movement. I am satisfied that many cases treated as typhoid fever are nothing more or less than septic fever produced by the decomposition of the contents of an over-loaded colon. I have demonstrated this fact many times by simply giving proper enemas and unloading the colon—the nervous symptoms and temperature of the supposed typhoid disappearing at once. Simply because castor oil or other purgatives given produces many liquid stools, the abdomen flattens, and little food having been given a false feeling of security arises in the physician's mind that the bowel is clear, when in fact the liquid elements pass over the impacted masses in the prolapsed sigmoid as water passes over pebbles in a brook—the water flowing on while the pebbles only roll about.

As drastic as this may seem yet the truth of it remains. I am convinced that this condition of ignorance exists because the same care and diligence is not observed in the methods of examination of the rectum as are observed in other portions of the body.

Symptoms.—In my articles published in THE AMERICAN JOURNAL OF SURGERY December, 1910, and again in August, 1911, of acute angulation, flexure and impaction of the sigmoid there is an outline of the symptoms in the cases of epilepsy reported.

In order to gain a clear understanding of the nature of the affection I will again enumerate the most prominent symptoms.

Normally the colon from cecum to rectum is practically of one caliber (Fig. 1), and all curves and angles are of such a nature that very little obstruction to the passage of the contents obtain.

The condition of angulation and flexure is insiduous in its nature and is the product of months of irregular habits of living and the gross neglect of nature's laws. There is an increasing tendency to constipation; an increased necessity for purges, with diminishing effects; increasing feeling of fullness in abdomen; palpation reveals a distended, tympanitic and more or less sensitive cecum and transverse colon. (Fig. 2—F); an increasing dullness in left groin extending in some cases along the descending colon to the splenic flexure. In aggravated cases, from pressure on the bladder, frequent micturition; increasing flatulence, particularly at night; more or less a feeling of fatigue and a disinclination to work and a feeling of drowsiness after eating; at stool there is only a small result of dry hard scybala, which when passed leaves a feeling as if more was to come, yet the more effort exerted the less the result. If an enema is given only part returns. At night patient becomes very restless and has an intense feeling of heat, with no rise of temperature there is sleeplessness; after hours of restlessness flatus is expelled, followed by peaceful slumber. In case of the epileptics the appetite is voracious; eating anything, at any time and whenever they can get food to eat. Of all my cases of epilepsy having this condition, every case gave the history of inordinate, irregular and hasty eating. They also gave a history of taking all manner of purgatives, enemas and mineral waters.

Sigmoidoscopic examination reveals a more or less suffused and hyperemic rectal mucous membrane; occasionally an ulceration near point of angulation (Fig. 2—a); acute angulation at recto-sigmoidal juncture (Fig. 2—d); some invagination of sigmoid into rectum; beyond, the sigmoid is prolapsed and impacted (Fig. 2—c). In severe cases

of long standing the sigmoid may be bound down in its abnormal position by more or less dense adhesions (Fig. 2—b).

TREATMENT.

Diet.—On account of these patients being gluttons and very irregular in their habits of eating, the first and most important factor is to curtail their appetites. This must be most positive or else all efforts will fail. The food must be reduced to the simple, nutritious foods taken at regular hours and plenty of time taken for thorough mastication. Until the lower colon and sigmoid are thoroughly cleansed of all retained feces, meat should be interdicted except once or twice per week; an abundance of fruit may be allowed, such as apples in any form, stewed prunes, either dried or the home canned fresh ones; juice of oranges, etc. The heavy meal should be taken at the noon hour and the evening meal should consist only of a bowl of bread and milk, milk toast, oyster stew and bread and butter or some similar light foods.

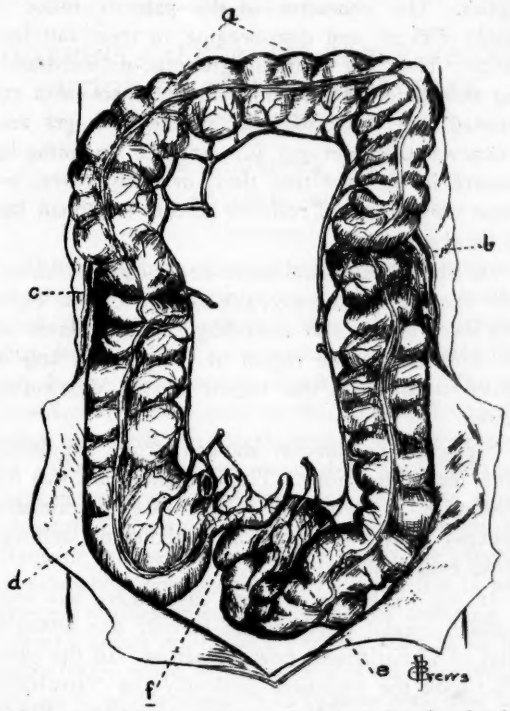

Fig. 1.—Normal Colon. *a*, transverse colon raised to show *b*, splenic flexure; *c*, hepatic flexure; *d*, cecum; *e*, sigmoid; *f*, rectum.

The object of restricting the diet is to have as little waste material as possible, thus allowing an already overloaded and distended bowel to empty itself and to regain its normal vigor.

Drugs.—Drugs internally have but little effect on these conditions, except occasionally some remedy is administered to allay fermentation or a laxative to keep the new formation of feces in a liquid or semi-solid condition until the bowel conditions are rectified by other means. The condition originally in a goodly per cent. of cases is brought about by the abusive use of drastic purges and injudicious use of enemas, and given now would only serve to aggravate instead of aiding in the relief.

For a laxative to aid in re-establishing the normal desire for stool, I am accustomed to giving calomel ¼ to ½ grain after the evening meal and before retiring, followed next morning at a fixed hour by an enema of ½ pint of cold water as recommended by Tuttle of New York. Any after dinner pill or tablets of aloin, strychnine, belladonna and ipecac may be substituted. These to be continued until the normal desire for stool is established at that regular hour. I also recommend and give other meals as an anti-ferment and digester of dilute hydrochloric acid, bismuth subnitrate and essence of pepsin in combination, the proportion to suit the individual case.

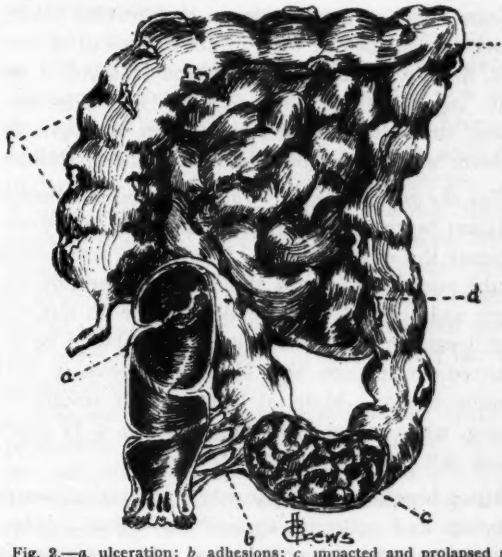

Fig. 2.—*a*, ulceration; *b*, adhesions; *c*, impacted and prolapsed sigmoid; *a* acute angulation at recto-sigmoidal juncture; *e*, angulation at splenic flexure; *f*, enlarged and distended cecum.

The trouble is local and mechanical and must be relieved by local and mechanical methods.

Local.—All fissures, fistulas, eczema and other irritable conditions of the anus should be relieved; all hemorrhoids causing any delay in the free movement of the bowel should be removed; if the coccyx is dislocated, fractured or inflamed and irritable it should be removed.

By the electric lighted pneumatic sigmoidoscope the rectum and sigmoid should be explored. Any ulceration, angulations, impactions and invaginations found should be treated locally under the guidance of the eye through the instrument.

For the ulceration a 2 per cent. to 10 per cent. silver nitrate, a 10 per cent. to 20 per cent. argyrol solution or pure ichthyol applied by cotton swabs are the most effective remedies, followed by daily irrigations of warm salt solutions. In the absence of sigmoidoscope the rectal tube or a reflow tube may be used, which a 1-4000 to 1-2000 nitrate of silver; 1-1000 argyrol or a 10 per cent. ichthyol enemas may be given every second or third day.

For the impaction an enema of olive oil of four to six ounces is given while in the knee chest position. This is best given through a large male catheter, with funnel attached. If this is not effective sometimes a 2-quart 2 per cent. peroxide enema given will be more effective. Other applications which are available to the general practitioner are enemas of four to six ounces of 20 per cent. fl. extr. kramerie, 20 per cent. ichthyol, 5 per cent. argyrol, olive oil, and such like remedies. These small enemas are best given through the catheter with the purpose of having them retained.

For the angulation after the impaction is relieved, inflation by the sigmoidoscope has been in my experience the most effective, followed in some cases by the insertion of a stiff Wales bougie through the angle and allowed to be retained 15 or 20 minutes each treatment. At home the patient should be instructed to assume the knee-chest position and breathe deeply. Material benefit often results by taking, while in the knee-chest position, a ⅔ quart warm salt water enema twice weekly.

Much benefit may also accrue if the patient wears a firmly and properly applied abdominal binder. This is particularly useful after the prolapse is overcome to prevent its return.

These methods and remedies, varied according to the nature and severity of the case, will prove effectual. Each case must be treated according to the findings, and results will be secured in accordance with the thoroughness of the examination and a proper appreciation of the existing conditions. The number of treatments varies from daily to two or three each week.

Surgical.—All cases of angulation and impaction with adhesions and inflammatory conditions which do not yield to these local methods are best met by abdominal section and the particular operation practiced that best fulfills the conditions met.

Gant of New York assures me he has cured several cases of epilepsy by the removal of an inflamed and injured coccyx, painful fissures and by relieving the adhesions of the sigmoid. J. Dawson Reeder of Baltimore also assures me he was able to cure a case of hysterical insanity by abdominal section and relieving the adhesions and performing sigmoidopexy for the prolapsed sigmoid.

Even though a complete cure is not effected by the local or surgical means, the benefit derived well repays the expense and effort.

REPORT OF DR. F. T. WILT, ASSISTANT PHYSICIAN WESTERN HOSPITAL FOR INSANE.

During the past year I have examined and treated with the sigmoidoscope 31 cases of our male epileptics. The character of the patients make it rather difficult and discouraging to treat satisfactorily. They are naturally gluttons, notwithstanding the advice and attempts to put them on a restricted diet; they will eat all they can get and whenever they can get it. Another discouraging feature is the fact that they, in many cases, become very ugly and resistive so that treatment has to be abandoned.

On abdominal examination in all cases, with but one exception, tympany was elicited on the right side over cecum and ascending colon; dullness on the left side in the region of the sigmoid and in many instances in the region of the descending colon.

Sigmoid examination showed acute angulation with fecal impactions. The one exception was the case of E. P., who was a clear case of traumatic epilepsy. He was normal as to abdominal and sigmoid examinations.

In my treatment of these cases there has been marked mental improvement in only one instance, that of Christianson, now on parole. In the cases who took the treatment faithfully the convulsions became fewer and less severe in character. Physically, the patients appeared to be stronger and more active. Mentally, they are less confused and slightly more ambitious. This may be accounted for by the fact that the convulsions are of a less severe character. The best results I have obtained are in the cases of status epileptics—in three cases especially I may mention. The patients were passing from one convulsion into another. With the aid of the sigmoidoscope I gave a high rectal, 2 per cent. peroxide of hydrogen enema, which was followed by enormous evacuations in each case. I then gave a slow enema, one pint of normal salt solution, for retention. The result was remarkable. Prior to this morphine apparently had little or no effect, but after the thorough cleaning out of the

colon patients became quiet and sedatives were used with good results. I can certainly recommend this treatment in these cases.

This certainly is not a very encouraging report to give, but the way some of these patients have acted has almost knocked the enthusiasm out of me, but it has not knocked the enthusiasm out of me for the sigmoidal examination in other cases. I believe you have put me in the way of curing a number of other cases, especially those of the maniac depressive insanity, depressed state. I have treated several by this method with good results.

UTERINE CANCER; ITS EARLY RECOGNITION BY THE GENERAL PRACTITIONER.

JOHN C. MURPHY, M.D.,
ST. LOUIS, MO.

If there is any one word in the English language capable of striking terror to the heart of womankind, that word is cancer. How often it happens that one is obliged to announce to a sufferer that her disease is cancer and cannot be cured. The expression of hopelessness on the face of the victim when she finds herself abandoned to the ravages of a loathsome disease, doomed to spend her last days in an agony of pain or an opium stupor, is not pleasant to look upon. Such occurrences are not infrequent, and serve to make the life of the surgeon a melancholy one, provided he still has left in him enough responsiveness to feel for the suffering of others. Death under such circumstances is all the more tragic when we consider that all cases reaching an incurable stage do so because some one has blundered. Delay in proper treatment cannot always be blamed on the patient, for, in my experience, women are becoming acutely alive to the fact that cancer is claiming many victims among their sex, and at the slightest indication they seek the advice of the family doctor, who all too frequently lulls them into a false security by a false diagnosis. It is the duty of the doctor to know, and if he does not know, to find out. "Seek and you shall find" was never truer than in its relation to cancer.

If we could seek out the cause of every case of irregular hemorrhage from the uterus occurring in women over twenty-one years of age there would be fewer doomed to fill premature graves, and the cancer blot on the medical escutcheon would grow dimmer and dimmer. I mention the early age of twenty-one, for twice in my experience I have seen carcinoma of the cervix in the twenty-second year. Both patients had borne children, and the cervix had been torn and left so. I have never seen carcinoma of the cervix in a nulliparous woman. If prolonged irritation at a given point is a possible cause of cancer it follows that such sources of irritation should be removed as a preventive of future trouble. Some obstetritions think they are doing their full duty if, after delivery, they sew up a torn perineum, but they seldom give a thought to the greater trouble possible from a frequently present but often neglected cervical injury. Unhappily, there are men who leave undone that which they should do, and thus jeopardize the future wellbeing of their patrons.

There are very few men past sixty years of age in the medical profession who ever look into a microscope, and fewer still who would know what they saw if they did. However, it is not necessary to be a skilled pathologist in order to do one's part in the fight for victory over malignant disease. But it does take more formidable weapons than a pleasant smile and air of confidence. A pat on the shoulder and a reassuring remark about "just a little congestion" or the "change of life" (according to the age of the sufferer) never cured cancer and never will. But faith in such advice has cost countless women their lives.

It is not essential to mention here the operative procedures for the relief of uterine cancer, as they are well understood by the surgeon. In this appeal my desire is to point out the danger signals to those who are first consulted, and how to recognize them early, that patients may be brought to the surgeon soon enough to warrant hope of cure. The age of the patient has no particular bearing on the possibility of cancer, for in the light of present knowledge the disease is known to occur in a much earlier age than was formerly supposed. Ashton reports a case of adenocarcinoma in an unmarried girl of twenty years, and Cullen reports two cases at thirty, and I add my two cases of carcinoma of the cervix in the early twenties. So we should be vigilant at all ages, once our suspicions are aroused.

Cancer of the body of the uterus may prove misleading, as it is hidden from view and hemorrhage may not occur until the disease is well advanced. Pain may be entirely absent. A watery, possibly blood-streaked leukorrhea, however, is a fairly constant symptom, as the disease has its origin in the utricular glands. The curet is the best preliminary aid to diagnosis, but curettage must be done in a thorough manner, every portion of the endometrium

being removed, as the disease is circumscribed at its inception, and the whole endometrium must be examined to avoid mistakes.

Adenocarcinoma of the cervix may also escape early recognition, as it starts primarily in the cervical canal and remains hidden from view until great damage is done. Squamous-cell carcinoma (the most frequent form) has its origin in the squamous epithelium covering the vaginal portion of the cervix. This type of cancer may readily be seen, and there is no excuse for failure to recognize it, as the preliminary hardness of the cervix, its glazed appearance and the papillary excrescences on its surface are characteristic. And in spite of this visible evidence of serious disease there are those who continue to paint the cervix with iodine and pack the vagina with glycerine-soaked cotton, until some day the patient has a profuse hemorrhage and the vaginal vault is found filled with a crater-like sloughing mass. Then she is hurried to the surgeon, only to hear her death knell.

According to Gilliam over one-thrd of all deaths from cancer in women are cervical.

It is too broad to assert that every death from such a cause is a reflection on the doctor, but it is safe to say that many could have been saved by an early diagnosis. Once the disease has passed beyond the confines of the uterus curative treatment is impossible. Some put the percentage of recoveries in cervical cancer as low as 5 per cent.; all of which accentuates the necessity for more accurate observation by the family doctor. Primary cancer of the body of the uterus has a better prognosis, being placed at about 50 per cent. of cures. How much better it could be with closer attention to early symptoms. Cancer always was and always will be, but the way to control it is never to cease to look for it and then be able to recognize it when you find it.

In these times the only excuse for ignorance is indolence. With the post-graduate opportunities in this country to-day any man with energy can equip himself with the necessary knowledge at small expense. With more post-graduate work by those in general medicine the earlier would malignant disease be recognized and fewer cases would come to the surgeon in hopeless condition. Prevention is always better than cure, and while the etiology of cancer is speculative, we know that cervical cancer is practically confined to child-bearing women, and it is our plain duty to leave them in the best possible condition after labor.

In your zeal to repair the perineum do not forget to examine the cervix after the period of involution. View with suspicion every woman with a watery leucorrhea; it may be the first visible evidence of trouble. Examine carefuly every woman past the menopause who complains of irregular bleeding. Do not wait for the foul odor of necrosis before acting. Curet such a patient thoroughly and submit the scrapings to a competent pathologist.

When the cervix is found enlarged, glossy and nodular do not waste valuable time with iodine applications; excise a small portion from the suspicious area for microscopic examination. Do not overlook the fact that advanced age is not a necessary accompaniment of cancer. Do not be misled by the outward appearance of the patient. I operated on one of the healthiest looking women I have ever seen for carcinoma of the cervix.

With these few facts constantly in mind the family physician can do much to aid the surgeon in his up-hill fight for mastery over that dread destroyer of life and happiness—cancer.

4263 MORGAN STREET.

THE VALUE OF COLEY'S TOXINS IN SARCOMA.

What conclusions can be drawn regarding the value of the mixed toxins as a remedy in sarcoma? Can it be called a specific in the treatment of this disease? I think every unprejudiced observer will agree in denying any such power to this remedy because comparatively few persons are cured by its administration—the vast majority—at least 90 per cent. of the cases are uninfluenced by its use.

Is it a promising remedy—one that gives evidence of increasing value in the future? My experience leads me to believe that one is not justified in assuming that this treatment will ever influence any large proportion of the cases of sarcoma favorably.

Does the use of the toxins ever bring about a cure of sarcoma? It undoubtedly does have such an effect in a small number of cases.—J. C. OLIVER, in the *Ohio State Medical Journal.*

CIRCUMRECTAL ABSCESSES.

Infections in the deep circumrectal spaces are usually not due to rectal disease at all, but to prostatic, urethral and uterine conditions; they not infrequently, however, break into the rectum, or, as was formerly the case, have been opened by surgeons into this organ—a most unsurgical and dangerous procedure. Early diagnosis and treatment of such conditions are of the utmost importance, for they are really dangerous to life.—J. P. TUTTLE, in the *New York Medical Journal.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JANUARY, 1912.

AN UNWARRANTED ATTACK ON THE PRESIDENT AND OTHER EMINENT MEMBERS OF THE AMERICAN MEDICAL ASSOCIATION AND ON THE LEADING MEDICAL JOURNALS OF THE COUNTRY.

It has been the consistent policy of the AMERICAN JOURNAL OF SURGERY to limit its pages to strictly surgical matter, and in its editorials to avoid the discussion of all non-surgical subjects. We have sacrificed no space to any discussion of, or controversy concerning, the fight of the *Journal of the American Medical Association* against "independent medical journals," nor have we allowed what we have considered the unfair treatment of some of our advertisers by the Council on Pharmacy and Chemistry to intrude its expression in our reading pages. We have believed that much of the denunciation of independent journals was justified—albeit the fight was not always fairly waged—that the unworthy journals would perish (as most of them have done), and those that deserved to would survive and flourish (which most of them have). When the *J. A. M. A.* has occasionally denounced our advertising pages we have met these unkind flings with dignified silence and good nature.

Perhaps because we have not thought it worth while to retort to these previous sallies the *J. A. M. A.* in its issue of December 16, 1911, launched three columns (pages 2000, 2001 and 2013) of abuse against the professional conscience of the "editors and proprietors" of the AMERICAN JOURNAL OF SURGERY and, inferentially, of the "editors and proprietors" of most of the leading journals of this and foreign countries.

Not content with attacking us, the *J. A. M. A.* has gone much further. It has undertaken to abuse also the prominent surgeons who have—and because they have—contributed to this Western Number of the AMERICAN JOURNAL OF SURGERY.

The assault on ourselves we might, pursuing our policy, reluctantly ignore, but as host we are too outraged to pass by this insult to our guests. Therefore, we are impelled to violate our own rule to avoid non-surgical controversies in these columns in order to reply to the presumptuous, unwarranted and unfair attack that has been made upon our eminent contributors and upon ourselves

In its editorial the *J. A. M. A.* weeps to find "some of the leading members of our profession 'featured' as contributors to a medical journal whose advertising pages fairly bristle with pharmaceutical frauds and humbugs, many of which have been exposed in the *Journal of the American Medical Association.* Nor is this all. The names of these men—names that command the respect and admiration of the profession—have been further used by the journal in question as a commercial asset to obtain subscriptions. Circular letters have been sent broadcast notifying the profession that articles by these men would appear in certain issues."

There is not the slightest impropriety in announcing our contributors as a means of attracting subscribers. Such announcements are employed by the *American Journal of the Medical Sciences,* by *Surgery, Gynecology and Obstetrics,* and by professional and lay magazines generally. The names of the "leading members of our profession are 'featured'" in the book advertisements carried by the *J. A. M. A.!* Such announcements constitute the legitimate and practically the only way that a magazine without a ready-made subscription list can establish its circulation. The editor who wrote this diatribe in the *J. A. M. A.* knows this is so, as well as every reading adult knows it, and he was guilty of wilful bad faith when he intimated that the names of the surgeons contributing to this journal were being used in any improper exploitation. But, especially, the *Journal of the American Medical Association* lectures its president, Dr. Murphy, and his eminent colleagues because they see fit to contribute to the AMERICAN JOURNAL OF SURGERY, "this nostrum-promoting publication" (and incidentally, although not expressedly, because they also see fit to contribute to the *Annals of Surgery* and to *Surgery, Gynecology and Obstetrics,* of which Dr. Murphy is an editor, which "promote" the same nostrums).

And so we are "shown the unedifying spectacle" of the *J. A. M. A.,* the servant of our national association, striking at reputable members of that organization—the "editors and proprietors" of the AMERICAN JOURNAL OF SURGERY—over the backs of "men who hold or have held high offices in the American Medical Association. Presidents, vice-presidents, chairmen, secretaries and members of sections of the association * * * whose names appear as contributors * * *"!

In its "Propaganda for Reform" (page 2013) the *J. A. M. A.* pilloried the AMERICAN JOURNAL OF SURGERY because it violates the principles of the ethics of medical advertising. What is the standard that establishes these "principles"? The *J. A. M. A.* recognizes no other judgment than the Chicago standard, a Council which has made mistakes, and in whose deliberations no medical journal has voice or representation except the *J. A. M. A.* "THE AMERICAN JOURNAL OF SURGERY," continues the propagandist, "is a good example of the evil against which we are protesting. In its editorial and reading pages generally there is little to criticize and much to praise. In the advertising pages, however, conditions are reversed * * *; page after page is given over to the exploitation of the worst kind of nostrums. Here are some of them:

"Antikamnia
Phenalgin
Micajah's Wafers
Tyree's Antiseptic Powder
Campho-Phenique
Anasarcin
Sal Hepatica
Cactina Pillets
H-M-C
Resinol
Ecthol
Hagee's Cod Liver Oil Compound
Gonosan
Colchi-Sal
Scott's Emulsion
Hydrozone
Glycozone
Papine
Tongaline
Aletris Cordial Rio
Bromidia
Celerina
Resor-Bisnol
McArthur's Syrup of Hypophosphites
Hayden's Viburnum Compound
Gray's Glycerine Tonic
Listerine
Fellows' Syrup of Hypophosphites
Pepto-Mangan
Pinus Canadensis
Dioviburnia
Neurosine
Peacock's Bromides
Chionia
Prunoids
Seng
Antiphlogistine
Glycothymoline
Unguentine."

Not many years ago many of these proprietaries were, and all of them would have been, welcome in the advertising columns of the *J. A. M. A.* And to-day these advertisements are to be found *in most of the official journals of the State Medical Societies,* in the *American Journal of the Medical Sciences, Annals of Surgery, Surgery, Gynecology and Obstetrics, American Journal of Obstetrics, Medical Record, New York Medical Journal, Boston Medical and Surgical Journal, British Medical Journal, Lancet*—and, in short, in most of the standard medical journals of the world—American, English, German, French. We do not say this to show that the *J. A. M. A.* is almost alone in the righteousness which it proclaims, but does not practise; nor to plead excellent company as an excuse for any alleged shortcomings of our own; but to indicate that there was no reason for "picking on" us except pique that men who have helped to make the *J. A. M. A.* great are glad to contribute also to the AMERICAN JOURNAL OF SURGERY.

A "Physicians' Manual of the Pharmacopeia and the National Formulary," *compiled and edited under the direction of, and copyright and published by, the American Medical Association,* was distributed among the profession about three years ago. It will be interesting to make some comparisons between "the worst kind of nostrums" as above listed by the *J. A. M. A.*, and the preparations in this ethical "Physicians' Manual."

"The Worst Kind of Nostrums." *Journal of the American Medical Association,* December 16, 1911.

Physicians' Manual of the Pharmacopeia and the National Formulary. Compiled and edited under the direction of and copyright and published by the American Medical Association. 2d edition, 1908.

LIQUOR ANTISEPTICUS [U. S. P.]—Antiseptic Solution (Lister).—A soluton of boric acid, 2 per cent.; eucalyptol and oils of peppermint, gaultheria, thyme and 25 per cent. alcohol. Essentially similar to the various proprietary solutions.

Listerine.

Uses: Antiseptic; internal and external.

Dose: 4 Cc., or 1 fluidram.

Liquor Antisepticus Alkalinus, N. F.—Alkaline Antiseptic.—Aqueous solution with 25 per cent. glycerin, containing potassium bicarbonate and sodium benzoate, each, 3.2; sodium borate, 0.8; oil gaultheria, 0.004; thymol, eucalyptol and oil peppermint, each 0.02 in 100 Cc., *colored purplish red with persionis.* [italics ours]. To replace a well-known alkaline antiseptic solution of similar composition. Prescribed under its official name and dispensed in plain bottle (without the name blown in the glass) this article will not become known to the public as a cure-all.

Glycothymoline.

Uses: Antiseptic, externally and internally, diluted with four to five times its volume of warm sterile water.

Elixir Gentianae Glycerinatum, N. F.

Uses: Bitter tonic, stomachic.

Dose: 8 Cc., or 2 fluidrams, representing gentian, taraxacum, phosphoric acid, in glycerin and white wine, flavored with sweet orange peel, compound tincture cardamon and acetic ether. Similar in composition to a trade-article becoming known to the public as a "glycerin tonic."

Gray's Glycerine Tonic.

Liquor Ferri Peptonati cum Mangano, N. F.—Solution of Peptonate Iron with Manganese.—An agreeably flavored, non-styptic solution, representing about 0.4 per cent. metallic iron and 0.2 per cent. metallic manganese masked in the form of peptonates and containing about 25 per cent. (vol.) alcohol.

Pepto-Mangan.

Practically identical in composition with a certain German "patent medicine." Prescribed under its official title and dispensed in plain bottles (without the name blown in glass), it should be given the preference by physicians.

Uses: Hematinic, chalybeate tonic.

Dose: 8 Cc., or 2 fluidrams.

CATAPLASMA KAOLINI [U. S. P.]—Cataplasm of Kaolin.—"Antiseptic Clay Paste." Similar in composition to certain proprietary articles sold under fancy names such as Antiphlogistine, Anhydrosine, Thermofuge, Thermaline, Unguentum Terralis, etc.

Antiphlogistine.*

Mixture of elutriated anhydrous kaolin 57.7 parts, levigated with glycerin 37.5 parts, and containing 4.5 parts boric acid, 2 parts methyl salicylate and one-half part each thymol and oil of peppermint.

Uses: Antiseptic, antiphlogistic, analgesic; applied hot to inflamed surfaces, etc.

SYRUPUS HYPOPHOSPHITUM COMPOSITUS [U. S. P.]—This syrup is intended to replace a well-known proprietary medicine and should always be followed by the designation U. S. P., to distinguish it from other compound syrups of hypophosphites of different com-

Fellows' Syrup of Hypophosphites.
McArthur's Syrup of Hypophosphites.

*Because it did not conform to all the rules of the Council of Pharmacy, antiphlogistine was rejected a few years ago from the advertising pages of the J. A. M. A., and from the commercial display at the Atlantic City convention, but a preparation essentially identical in composition and uses was admitted to both—and subsequently rejected.

position. It should be given the preference over the "patent" article that has the name blown in the bottle.

Uses: Nerve nutrient, hematinic, reconstructive.

Unguentum Resorcini Compositum, N. F.—(Soothing Ointment).—Resorcinol, 6; zinc oxide, 6; bismuth subnitrate, 2; oil cade, 12; petrolatum, lanolin, to 100 parts.

Resinol. Uses: Antiseptic, antipruritic, discutient.

Similar in composition to several trade articles, having the advantage of uniformity in composition and superior stability.

PULVIS ACETANILIDI COMPOSITUS [U. S. P.]—Compound Powder of Acetanilide.—This was admitted to the U. S. P. (VIII.) from the National Formulary in order to indicate the composition of the vast

Antikamnia. number of mixtures of acetanilide which as trade articles, "headache powders," etc., are of more or less secret composition:

Acetanilidi .....gr. C. 7
Caffeina .....gr. xv 1
Sodii bicarbonatis ...gr. xxx 2
Dose: 0.5 gm., or 7½ grains.

Here is a fine example of "double dealing"—to borrow the friendly expression which the *J. A. M. A.* fraternally applies to us! The meanest merchant would not denounce an article as a fraud and try to sell an imitation of the same article under another name. Yet these tactics are not too petty for the central organization of our national association, which has written a code of professional ethics and which sets itself up as the only righteous standard of ethics of medical advertising! **In its weekly organ, the American Medical Association denounces certain preparations as "the worst kind of nostrums"; and in another publication, which it edited (note the comments under the titles quoted), compiled, copyrighted and published, it encourages, or at least countenances, the deliberate imitations of those "nostrums."** There is no escaping the cant and hypocrisy of such a proceeding. If "liquor antisepticus alkalinus * * * colored purplish red with persionis. To replace a well-known alkaline antiseptic solution of similar composition" (editing by the A. M. A.), is, indeed, "antiseptic, externally and internally," and is an ethical preparation, as the Physicians' Manual indicates, then glycothymoline, the original, whatever else may be said of it, is certainly not "the worst kind of nostrum."

The only reasons we have ever heard advanced why the N. F. and U. S. P. imitations should be prescribed in preference to the original proprietaries are, first, to discourage self-drugging, and, second, that the corner pharmacist can dispense the imitation cheaper than the original. As to the first reason, it is just as easy to order peptomangan or resinol in plain containers as it is their long-named imitations. As to the second reason, the larger profit is the legitimate earning of the merchant whose ware has established a reputation, just as it is of the surgeon or physician whose fame has surpassed his neighbors'. But, as we shall presently see, the patient's pocketbook is not always the tender concern of the *Journal of the American Medical Association.* The fact is that the corner druggist can *not* more cheaply or as elegantly compound the U. S. P. or N. F. imitation of the proprietary, and therefore he either dispenses from the proprietaries themselves or from a stock of the imitations prepared by some large pharmaceutical manufacturer. And so, when you want your patient to have listerine or glycothymoline, if the A. M. A. has persuaded you to order liquor antisepticus or liquor antisepticus alkalinus, it has, in fact, coaxed you to divert a legitimately earned profit from the Lambert Pharmacal Co., or Kress & Owen, respectively, to some wholesale manufacturer who has risked no capital and spent no effort to deserve it. And yet you are told that this is the *ethical* thing to do.

We cannot give space to a consideration of all the other preparations on this list of "nostrums," but a few words concerning some of them:

We do not know whether cactus grandiflorus is inert, as certain experiments would indicate, or is a real cardiac tonic, as many careful clinicians believe. but we do know that **Cactina Pillets have been prescribed by a gentleman who is active in the Section on Pharmacology and Therapeutics of the A. M. A. and who has collaborated in some of the reports of the Council on Pharmacy.**

We do not recall at this writing what action, if any, the Council took on Bromidia, but we do know that it is prescribed by many reputable physicians, among them at least one well-known neurologist and psychiatrist, and we assert the same of Peacock's Bromides.

In the department of Therapeutics of the issue of the *J. A. M. A.* in which the American Journal of Surgery and its contributors were bombarded, there is a consideration of "scopolamin (hyoscin) and morphin as an anesthetic," in which the uses and dangers of this combination are set forth. The Council on Pharmacy and Chemistry has maintained that scopolamin and hyoscin are identical, and that cactin is inert. If these be so, then, by all the rules of logic, the combination of hyoscin, morphin and cactin is therapeutically identical with the combination in the same strengths of scopolamin and morphin. If the latter is legitimate, how can the former (H-M-C) be the "worst kind of nostrum"? In fact, however, the identity of scopolamin and hyoscin has not been finally established (the British Pharmacopeia, according to the *J. A. M. A.*, does not recognize it), nor has the inertness of cactin. Meanwhile, we regard it as fair to allow the Abbott Alkaloidal Co. to state its claims for H-M-C in our advertising department.

The claims of some of the proprietaries denounced in the above list are indeed exaggerated (and some of the advertisers in the American Journal of Surgery will not be allowed to renew on the expiration of their contracts), but exaggeration is hard to eliminate from any advertising. The ads. in the *J. A. M. A.* indicate this clearly. Thus the advertisement of

"SCARLET SALVE"

an excellent ointment of Biebrich's Sharlach roth, nevertheless clearly violates rule 6 of the Council on Pharmacy and should not have appeared in the *J. A. M. A.*

Again, will the *J. A. M. A.* vouch that

"EXT. CHINAE NANNING."

which it advertises, is, indeed,

"A bitter tonic of exceptional utility in all functional gastric disorders, defective metabolism and diseases of psycho-neurotic origin"?

On another page of the *J. A. M. A.* (we still confine ourselves to the issue in which it was seen fit to throw stones at the American Journal of Surgery) we find an advertisement of BENZOSOL, NUTROSE and LYSIDIN. Is the *J. A. M. A.* really satisfied that BENZOSOL is "ANTITUBERCULAR and ANTIDIABETIC," that NUTROSE is "RECONSTITUENT" and that LYSIDIN —or any other known drug or combination of drugs—

is "ANTILITHIC and URIC ACID SOLVENT"?*

Does the J. A. M. A. investigate all the many sanitariums it advertises?

Will the J. A. M. A. assert that the advertisements of any or all of "the worst kind of nostrums" in the list it denounces are ethically half as bad as the following ad. which it has been running for weeks?

DOCTOR
DEFORMITY
APPARATUS
We can save you one half the price by ordering your direct from us, the largest manufacturers of this kind in the U. S.
Braces for Lateral or Anterior-Posterior Curvature of Spine, Hip Joint Splints, Knock Knee, Bow Leg, Weak Ankle and Club Foot. Braces of every description, also Trusses $1.50 up. Elastic Stockings $1.50 up. Artificial Limbs, etc. The head of the department is Dr. R. Wolfertz, who holds the degree of Doctor of Orthopedic Surgery with 20 years' experience. Our Appliances are guaranteed to be the very best and latest. One trial order will convince you of the above facts. We allow you a DISCOUNT of 40% OFF from prices quoted in our or any other Catalog. Measurements and particulars of every case correctly sent with the use of our application blanks. Catalog on request. Physicians' patronage everywhere and

There can be no quibbling about the offer, in bold face type, of "a liberal discount to physicians" (as the advertisement often reads). We know too well the meaning of the brace maker's "professional discount."

Here "is shown the unedifying spectacle" of the association Journal which condemns, or should condemn, secret fee-splitting among the profession, repeatedly publishing an ad. that offers a "rake-off" (40 per cent.) on the patients' bills! Further, will the J. A. M. A. tell us what the degree of "Doctor of Orthopedic Surgery" is, and where and how it is conferred?

We have selected these few advertisements in the organization journal not so much to meet vituperation with counter-charge as to show that "what's sauce for the goose," etc., and that perhaps the *J. A. M. A.* itself is *"the proper gander for reform."*

To further illustrate the unfairness and insincerity which the *J. A. M. A.* sometimes exhibits, let us mention a small matter, which we select because it is so petty. The *J. A. M. A.* regularly calendars the meetings of all the large medical societies, national, sectional and state, and especially at the time of the convention of the A. M. A. it announces the meetings of all the cognate societies (such, for instance, as the *American Association of Medical Examiners,* the *Confederation of State Medical and Licensing Boards,* etc.) which usually gather at the same time. But repeatedly and deliberately the *J. A. M. A.* has omitted all reference to the American Medical Editors' Association, an organization nearly 50 years old, of which the late Surgeon General Walter Wyman was the incumbent president and at whose annual banquet the president and ex-presidents of the A. M. A. are accustomed to gather. This organization is ignored in the *J. A. M. A.* for no other discoverable reason than that the editor of that journal does not personally approve of it!

The *J. A. M. A.* asks: "In all seriousness, do the members of the American Medical Association want the propaganda for reform in proprietary medicines to be continued or do they wish to see therapeutics slip back into the unscientific and chaotic condition that existed before the fight against fraudulent proprietaries was started?" . . . "Is it any wonder that they [editors and proprietors of independent journals] look on the propaganda for reform in proprietary medicines, instituted by the American Medical Association, as a joke? Is it any wonder that these men assume—with a large degree of reason—that the prominent men in the American Medical Association repudiate the propaganda work of the association?"

It does not occur to those who are undertaking the "propaganda for reform" that since the facts are as they have above stated the fault is less apt to lie with the many members of the American Medical Association than with the few who are conducting the propaganda—that there may be something in the methods of the propagandists themselves that may be improved upon!

Let us answer the *J. A. M. A.'s* question. The members of the Association do not want the propaganda for reform in proprietary medicines to cease. They approve and endorse it fundamentally. But they want to see it continued fairly and impartially. They want to see their great journal prosecute all commendable medical reforms, but also fairly and in a temperate spirit. They do not sympathize with wholesale denunciation of other publications for the same offenses of which their own journal is guilty. And they will not withhold their contributions from independent publications, conducted by reputable men, simply because those publications are not willing blindly to follow in the path of the organization journal whose own garment hems are spattered with mud.

If among the contributors to this issue of the AMERICAN JOURNAL OF SURGERY, who have all been set on the same bad eminence as ourselves, there should be any who have been led by the lecture the *J. A. M. A.* has felt called upon to deliver them, to forswear future contributions to the *American Journal of Surgery, Surgery, Gynecology and Obstetrics,* or *Annals of Surgery,* a word of comfort: Be consoled with the promised opportunity to confine your articles to the forthcoming *Archives of Surgery,* published by the American Medical Association itself, which, officially, denounces glycothymoline and gargles its busy official throat with *"liquor antisepticus alkalinus . . . colored purplish red with persionis. To replace a well-known alkaline antiseptic . . ."*

DR. MURPHY DISAPPOINTS.

We regret that we have been obliged to announce to our readers our inability to present in this issue the article on Surgery of the Tendons promised for it some time ago by Dr. John B. Murphy, of Chicago. Under date of December 21 he telegraphed: "Am overworked and cannot possibly get article ready."

In our editorial announcement of this Western Number the name of Francis C. was erroneously written instead of John C. Murphy, both of St. Louis.

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* These three preparations have all been accepted by the Council, but behold what it says of, for example, Lysidin: "Lysidin is said to be a diuretic and is recommended as a uric acid solvent on the theory that, because it forms a very soluble salt with uric acid, it will facilitate the elimination of that substance. It is claimed that it is superior to piperazine." "The attempt to secure the solution of uric acid in the body by this [Piperazine] as well as other remedies has not been successful in the experience of many clinicians. *There is no reliable evidence to warrant the acceptance of these claims"* [italics ours].—Quotations from NEW AND NON-OFFICIAL REMEDIES, containing Descriptions of the Articles which have been Accepted by the Council on Pharmacy and Chemistry of the A. M. A," 1911, pages 128 and 168, respectively.

Surgical Suggestions

A breaking-down sarcoma of the ilium may simulate a gluteal aneurism.

Not infrequently subacute inflammations of the Fallopian tubes will be found to be of tuberculous origin.

A mild degree of shock causes an increase in leucocytes; severe shock paralyzes the leucoblastic function.

A pulsating tumor in the side may be an aneurism of the abdominal aorta although palpation fails to disclose its connection with the aorta.

Before performing esophagotomy for foreign body, make a final examination (radiographic or otherwise) to determine that the object has not slipped into the stomach.

Persistent dyspareunia, with no other ascertainable cause, may often be found to lie in a chronic gonorrhea of Skene's ducts.

Some apparently inoperable carcinomata of the cervix will yield remarkably to repeated cauterization with the actual cautery and zinc chloride.

Any menstrual irregularity or abnormality in a woman who has hitherto been perfectly regular and normal in her menstrual periods, should always suggest the possibility of an ectopic pregnancy.

Injection into a fistula in ano of a staining solution or a colored paste makes it possible for the operator to assure himself that all branches of the tract have been explored.

It is worth while inaugurating the treatment of "idiopathic" pruritus ani by the administration of santonin or of enemata of quassia infusion—seatworms may escape discovery on one or two examinations.

If skiagraphs show the shadow of a calculus at the neck of the bladder when the patient is exposed lying flat with the organ empty, and in the same position when the pelvis is elevated and the bladder full, the stone is in the prostate (or prostatic urethra) or in a diverticulum behind the prostate.

Book Reviews

Technik der Thoraxchirurgie. (*Technic of Surgery of the Thorax.*) By F. Sauerbruch, Director of the Surgical Clinic of the University of Zürich and E. D. Schumacher, First Assistant in the Surgical Clinic of the University of Zürich. Quarto; 97 pages; 55 drawings and photographs, and 18 colored plates. Berlin: Julius Springer, 1911. Price, $4.80.

The first authoritative work on the modern surgical operations upon the thorax and its contents comes from the pen of two surgeons who have been prominent in the field for the past seven years. Of all the books on surgical technic that have come to our notice this one offers the clearest, most readily understood descriptions of operations. There are several reasons for this very unusual characteristic of a work on operative surgery: 1. Each procedure is briefly described in clear-cut, simple terms by surgeons who have repeated the steps of the described operations upon many occasions. 2. Every operation is illustrated by carefully sketched drawings and by excellent colored plates, which are enlargements of these drawings. 3 Thoracic surgery is not a thoroughly worked field at the present time, so that comparatively few operations need be described and relatively few modifications of typical procedures.

The authors are to be congratulated upon their timely work on a subject of great general interest, and the publisher upon placing the book before us in so artistic a form.

Nouveau Traité De Chirurgie, Publié sous la direction de A. Le Dentu et Pierre Delbet, XIX. **Maladies de L'Oesophage,** par Michel Gangolphe, Professor Agrégé à la Faculté de Medecine de Lyon, Chirurgien-Major Honoraire de l'Hotel-Dieu. Octavo; 115 pages, 39 illustrations. Paris. J. B. Ballieres et Fils, 1912. Price 4.50 francs.

This volume of the "Nouveau Traité" deals with the esophagus, a field rapidly gaining in surgical importance. The description of the clinical conditions—developmental malformations, spasm, infectious lesions (tuberculosis, syphilis, actinomycosis), inflammations, injuries, foreign bodies, cicatricial stenoses and new growths—in fully adequate and contains many interesting and instructive illustrations of various lesions as observed through the esophagoscope. *X*-ray views are also given. Although external esophagotomy and superior esophagectomy, and all internal surgical manipulations are described in full, the newer and bolder surgical interventions are barely mentioned. This book likewise lacks any reference to the important subject of positive and negative pressure operations, which promise so much for the extension and success of thoracic surgery.

Case Histories in Neurology. A Selection of Histories Setting Forth the Diagnosis, Treatment and Post-Mortem Findings in Nervous Disease. By E. W. Taylor, A.M., M.D., Instructor in Neurology, Harvard Medical School; Assistant Physician, Department of Neurology, Massachusetts General Hospital; Visiting Neurologist, Long Island Hospital, Boston. Octavo; 305 pages; illustrated. Boston: W. M. Leonard, 1911.

This is the fourth book of "The Case History Series," the three preceding being Case Histories in Medicine—Cabot, Case Histories in Pediatrics—Morse, and One Hundred Surgical Problems—Mumford, the reviews of which in these pages have sufficiently explained the purpose and pedagogic value of this case history system.

In this book 114 cases are described under the following divisions: Diseases Involving Peripheral Nerves; Diseases of the Spinal Cord; Diseases of the Brain; Conditions of Undetermined Pathological Basis; Psychoneuroses.

The cases are selected to illustrate diagnostic difficulties and clinical developments and to indicate treatment.

Progress in Surgery

A Résumé of Recent Literature.

The Diagnostic Value of Lateral Thoracic Glands. M. M. MANGES, New York. *New York Medical Journal,* December 9, 1911.

Manges calls attention to the value of enlarged lateral thoracic glands in the diagnosis of various chest conditions, especially cancer and tuberculosis. The glands occur in the fourth and fifth intercostal spaces in the axillary line. In two of six cases of intrathoracic neoplasms in which these glands were enlarged, microscopic examination of the gland revealed cancer. In preliminary tuberculosis they are frequently enlarged, but in only one case was a tuberculosis demonstrated by pathological examination. Manges believes that enlarged glands in this situation manifest themselves occasionally before obvious signs of pulmonary tuberculosis are manifest, and their presence in the course of a routine examination should lead to a careful examination of the lungs. To be indicative of tuberculosis, the glands must be hard, rounded and distinctly palpable. Their enlargement in intrathoracic conditions is explained by communications with the intrathoracic lymphatics, which have been demonstrated anatomically. Manges quotes von Zebrowski, who has studied this subject extensively. This author found enlargement of the lateral thoracic glands in 20 per cent. of all cases of tuberculosis, and in only 2.5 per cent. of non-tuberculous patients. Of the latter (42 cases) fourteen reacted to the Calmette and von Pirquet tests, eleven were normal individuals, four had carcinoma of the esophagus, four had furunculosis of the back and neck and two psoriasis. In Manges' experience, the percentage of glands in tuberculosis is not nearly as high as indicated by Zebrowski. Manges also quotes Brickner, who describes enlarged tender glands in this region which arise not uncommonly from an unsuspected furunculosis around the waist line.

The Operability of Intramedullary Tumors of the Spinal Cord. C. A. ELSBERG and EDWIN BEER, New York. *American Journal of Medical Sciences,* November, 1911.

Intramedullary tumors of the cord have been hitherto regarded as inoperable. The experience of Elsberg and Beer in two cases indicate that the removal of such tumors is by no means a hopeless task. They found that upon incision of the cord over the tumor, the latter is extended by the intramedullary pressure. This extension is noticeable almost immediately upon making the incision, and becomes complete or nearly complete within a few days. Elsberg and Beer, therefore, suggest the following method of treatment for intramedullary tumors of the cord: "If after laminectomy and incision of the dura the surgeon finds that he has to deal with a localized intramedullary growth, he should make a small incision, about 1 cm. long, in the posterior median column a few millimeters outside of the posterior median fissure, at the spot where the growth seems to be nearest the surface of the cord. The incision should be deep enough to cut the pia and the substance of the column down to the tumor. The tumor will then begin to bulge through the incision. No matter how markedly the tumor will seem to bulge, the surgeon must not attempt to remove the growth, for he will be sure to cause grave injury to the cord. He must leave it to nature to extrude the tumor. As the normal intramedullary pressure will tend to readjust itself, the growth, which has caused an increased pressure, will be gradually pushed out of its bed. Nature will do this by a slow and gradual process, and the tumor will be slowly extruded, with a minimum of injury of nerve fibers. Therefore, after the small incision into the cord has been made, the muscles and skin must be closed and the actual removal of the growth left to a second operation. After about one week the wound is reopened and the tumor, which will in all probability be found outside of the cord, can be removed by dividing the few adhesions which remain. If the manipulations are done with delicacy and care, no injury should be done to the cord substance. When the tumor has been removed, the pia should be closed by fine silk sutures, and the dura, muscles and skin sutured in the usual manner."

In one case a gliosarcoma of the cervical cord was thus removed with marked improvement of subjective and objective symptoms. In the second case, a glioma of the cervical cord was easily removed; the patient died, however, from respiratory paralysis.

Ileocecal Adhesions ("Lane's Kink" and "Jackson's Membrane"). F. G. CONNELL, Oshkosh. *Surgery, Gynecology and Obstetrics,* November, 1911.

The "Lane Kink," an upright or inverted "V" of adhesions, is found in the last four terminal inches of the ilium. It causes a kinking of the bowel, complicated by rotation on its long axis. The "Jackson membrane" extends from the hepatic flexure to three inches above the caput coli, there extending from the parietal peritoneum across the external lateral margin of the gut to be inserted into the internal longitudinal muscle band. It forms a thin, vascularized veil, which holds the ascending colon in rigid plication. The ilial kink is admitted to be due to descent of the cecum (development failure). The pericolic membrane has been ascribed to similar causes, to inflammation of the bowel or neighboring organs. Its accurate localization speaks against inflammation. As greater attention is paid to the condition it is observed with increasing frequency.

The symptoms produced are those of general enteroptosis—malaise, headache, backache, anorexia, nausea, even vomiting, eructations, pain or sense of fullness after eating, loss of weight and of muscular tone. Constipation may be obstinate, also brief periods of diarrhea. There is pain and hypersensitiveness in the right iliac region. These symptoms gradually become constant, making a chronic invalid of the patient. Later the symptoms described by Lane as "chronic intestinal stasis"—autointoxication, impaired nutrition, foul breath, clammy extremities, muddy hairy skin, cystic breast changes and neurasthenia develop. The diagnosis is comparatively easy, especially if after appendectomy no improvement follows.

The treatment consists in looking for kinks and pericolitis, wherever at the appendix operation this organ shows changes insufficient to account for the symptoms. Connell twists the pericolic bands into a firm strand and anchors it to the abdominal wall. Mayo covers raw areas with vaseline. Lane removes the large intestine or performs an exclusion operation (ilio-sigmoidostomy). Martin after operation puts the patient, throughout his convalescence, into the Trendelenburg posture and compresses the lower abdomen with a plaster jacket.

It is to be borne in mind that in chronic appendicits (?) cases these bands must be looked for, and that the small abdominal buttonhole incision is insufficient for this exploration.

A Review of Seventy-three Cases of Dudley's Operation for Dysmenorrhea and Sterility. S. M. BRICKNER, New York. *Surgery, Gynecology and Obstetrics,* November, 1911.

The operation was that described by Dudley, preceded by wide dilatation of the cervix and light curettage. The denudation of the anterior lip was omitted, but the splitting of the posterior lip, excision of two wedge shaped pieces and suture was performed typically.

The cases were 106 in number, all suffering from dysmenorrhea and sterility or both, with antiflexion. In all cases the husband's semen was first examined. In 73 cases answers were obtained upon inquiry. Of 21 private patients 84 per cent. were relieved of their dysmenorrhea and 42 per cent. of their sterility. Of 52 ward patients 55 per cent. were relieved of dysmenorrhea and 17 per cent. of sterility.

The author recommends the operation for both sterility and dysmenorrhea. He says that it is of greater service in the relief of the second type. The scar offers no hindrance to subsequent labor.

Pathological antiflexion or retroflexion of a hypoplastic uterus with stenosis of the external or internal os, or both, is a frequent cause of sterility and dysmenorrhea. These conditions can be relieved in 50 per cent. of properly selected cases.